How many....

• Are with an agency? NGO?
• Volunteer? Coordinate a volunteer program?
What Exit are You From?
Oswego River, Pine Barrens, N J
NJ 8.7 million people
7,505 square miles

18,126 miles of rivers & streams

Approximately 20% of the State’s Waters are fully assessed of that over 80% does not meet water quality standards
Myths of Using Volunteer Collected Data

• Quality Assurance & Quality Control
• Volunteers have “hidden agendas”
• Volunteers are not scientists
Reality of Using Volunteer Collected Data

• We need more data at a higher frequency of collection
• EPA has been encouraging the use of volunteer collected data since 1988
• Volunteers want to do it right
Clean Water Act

• Does Not State, “Only Monitor Waters You Can Afford to Monitor”

• It Does State, “States Must Consider using All Data of a Known Quality”
“....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 in my opinion.”-2013
NJ’s 4 Tiered Approach to Data Use

Allows for volunteers to choose level of monitoring involvement based on

– Intended purpose for monitoring
– Intended data use
– Intended data users
Education/Awareness → Problem ID, Assess Impairment, Local Decisions → Legal & Regulatory

Tier A → Tier D

Increasing Time - Rigor - QA - Expense $$

Credit to: Geoff Dates, Linda Green
Tier A-Environmental Education
# Tier D-Indicators & Regulatory Response

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<tr>
<th>Data Users</th>
<th>Data Use</th>
<th>Quality Needed</th>
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<tr>
<td>NJDEP</td>
<td>Assess current conditions</td>
<td>• High level of rigor</td>
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<td>Local decision-makers</td>
<td>Supplement agency data collection</td>
<td>• Study design &amp; methods need to be equivalent &amp; recognized by agencies using data</td>
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<td>Watershed associations</td>
<td>Research</td>
<td>• Training required</td>
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<td>Environmental organizations</td>
<td>Evaluate best management practices (BMP) measures</td>
<td>• QAPP approved by Office of Quality Assurance</td>
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<td></td>
<td>Regulatory Response</td>
<td>• Audits</td>
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Tiered Approach to Data Use

• Some states with a tiered approach
  NY, NJ, OH, OR, MO, VA, and others

• Provides training and resources for citizen groups to conduct their own monitoring programs
  – Macro id courses, study design, data analysis and interpretation, communicating data results, lab and field methods, etc...
Defining Data Use & Users

• Once you determine why you want to monitor

• You need to determine how you want that data to be used

• And who do you want it to be used by
NJDEP Data Users

- Watershed Area Managers *(TIERS B, C, D)*
- Water Assessment Team/Standards *(TIER D)*
- NPS Program *(TIER C, D)*
- TMDL Program *(TIER B, C, D)*
- Other Programs or Divisions
Regulatory Data Use is...

- Only for listing and delisting purposes?
- As a screening tool?
- Identifying hot spots for further monitoring from the agency?
- Notifying community and agency of a concern like the Gunpowder Creek example?
Pequannock River Coalition

Why did *we* choose temperature monitoring?

*Trout!*

Much of the Pequannock River mainstem and many river tributaries are classified as “trout production” where temperature can be a major limiting factor.

First documented fish kill caused by high river temperatures in the West Milford area in 1994.

River temperature reached 82F.

A second fish kill occurred in the same area in 2002.

River temperature reached 83F.
• Electronic “data loggers” are placed in the river at known monitoring locations in early summer for the whole growing season.

• Stations are located where data loggers can be checked frequently.

• Loggers record Temp every 30 minutes.

• Early Fall they are removed & data is downloaded.

Ross Kushner, Pequannock River Coalition
Are You Certifiable? Probably!

Requirements:

1 - Dedicated laboratory "manager" with experience or training.

2 - High-grade, approved QA/QC Plan and Procedures.

3 - Quarterly calibration checks of data loggers.

4 - Annual recalibration of NIST thermometer.

5 - Solid documentation of calibration tests, deployment sites, collected data, etc.

6 - Annual license fee ($900).

Ross Kushner, Pequannock River Coalition
Temperature Criteria

• Management of Reservoir Operations through NJDEP’s Water Allocation Permit
• Beaver Management
• Stormwater Management through adopted Regulations
• Shading through Streambank Restoration Projects
• NJPDES Permit Requirements
Pequannock River Characterization, Assessment & Management Plan

Results of our NJDEP funded study to identify and assess the impact of elevated water temperatures throughout the Pequannock Watershed
Delaware River Oil Spill Volunteer Emergency Response

- Basic Study Design
- Assigned Segments
- Assessment Tip Sheets
- Data Sheets *standardized* w/ State Protocol

- **No** Fixed monitoring locations
- **No** QAPP
- **No** Training
Oiled Debris in Need of Clean Up

Faith Zerbe, Delaware Riverkeeper Network
Boom Placement & Malfunction

Faith Zerbe, Delaware Riverkeeper Network
What did the Volunteers Document?

- 15 New Jersey tributaries suffered oiling
- One Delaware tributary suffered oiling
- 4 New Jersey Beaches suffered oiling
- Three wildlife preserves suffered oiling
- Various main stem Delaware locations

- 13 streams monitored had no signs of oiling at time of monitoring (PA and DE mostly)

Faith Zerbe, Delaware Riverkeeper Network
Riverkeeper Data Use

- Emergency response/clean up vigilance
- Talks with Coast Guard and NRDA officials – checks on scope of oiling, reports
- Press
- Increased citizen base for advocacy issues

Faith Zerbe, Delaware Riverkeeper Network
Natural Resource Damage Assessment

Faith Zerbe, Delaware Riverkeeper Network
All partners have a goal of restoring and protecting the Bay....
Barnegat Bay Model

- All passed proficiency sampling
- All used their own equipment
- All worked under the same quality assurance project plan (living document constantly changing)
- All told where & when to monitor
- All data made publicly available
NJDEP Procedures

- Field Procedures
- Sampling Procedures
- Methods for Sample Collection & Analysis
- Data Management
Accomplishments

• 5524 number of samples collected
  – June 2011 to present
• 13 partners
  – 5 labs
  – 2 schools/universities
  – 2 ngos
  – Government municipal, county, regional, state and federal
NJ WATERSHED AMBASSADORS PROGRAM

- Environmental Community Service Program
- Raise Public Awareness about Water and Watersheds
  - Partnership Projects
    - rain gardens and rain barrels
    - stream clean ups
    - training workshops
  - Environmental Presentations
  - Water Monitoring (1000 assessments per year)
Volunteer Biological Monitoring: Can It Accurately Assess the Ecological Condition of Streams?

- Sampling w/ professional methods concurrently w volunteers using SOS protocol

- Solely based on presences or absences of taxa

- 35% of samples were not in agreement

- Due to inaccuracy of oversimplified numeric analysis

Conclusion of Study

“...volunteer biological monitoring programs can provide reliable information about ecological condition, but every protocol needs to be validated by standard quantitative methods.”
NJDEP Streamside Macroinvertebrate Protocol

- 2000-05 protocols based on presences/absences of taxa
- 2005-2010 added counting number of individuals
  - One size fits all approach to metrics was not working
  - unreliable in the Pinelands & Coastal Plain Ecoregions
Better Tools for Biomonitoring

• Multimetric Index
• Sensitive to Eco Regions
  – Coastal Plain
  – Pinelands
• Aligns with NJDEP’s Biological Monitoring Indices for the Eco Regions

• User friendly Stream Side Identification
New Approach

• More Accessible to Citizen Scientists
• Reliable Assessment Tool for Eco-regions
• Cost effective Method for Assessment
Ah-ha Moment

• Use for Integrated Report
  – data of a known quality
  – chemical, pathogens, physical, habitat and macroinvertebrate

• The Macroinvertebrate tell the story....
  – Recalibrated Indices
  – Excellent or Poor Quality Streams
  – List or Delist for Assessment
Getting Started-Agency

• One point of contact for volunteers & agency staff
• Regular communication between volunteers/associations & agency
• Availability outside of normal working hours
• Training and workshops on nights & weekends
Getting Started-Agency

- Partnerships beyond host agency via service provider network
- Assistance from other Agency programs and staff
- Work directly with schools &/or organizations
- A budget (cost effective not cost free)
How will the Program Run?

- Will the agency look for volunteers to become part of a agency sponsored project?

- Will the agency work with existing groups that have their own monitoring projects?

- Will it be a combination of both?
Getting Started-Agency

• Volunteer monitoring becomes part of the day to day business of the Agency

• Give & Get

• Sharing both ways
  – Annual conference
  – Track success stories
  – List serves
  – Social Media
Budgets & Justifications

2012--64.5 million Americans, 26.5% of the adult population, gave 7.9 billion hours of volunteer service worth $175 billion

NJ--Volunteer wage is $25.33

www.volunteeringinamerica.gov
http://www.independentsector.org/volunteer_time
Data Management

• An afterthought
  – “It’s not prioritized and therefore not well thought out or well funded”
  – “It’s part of the solution to the perceived trust issue that gov’t agencies have with vol. data”

• Needs
  – Easier tools
  – Dynamic enough to change over time