Data to Action!

Using Volunteer-Collected Data to Protect and Restore Streams

Faith Zerbe, Delaware Riverkeeper Network

The Complete Cycle

Milestones

1) Program and Study Design
2) Monitoring and Recording
3) Data Entry and Validation
4) Data Summary
5) Data Interpretation
6) Data Presentation
7) Action and/or Further Monitoring

PA Volunteer Monitoring Stats

- CVMP Survey –
- 11,000 citizens
- >140 groups
- spent $1 Million
- 3000 stations state-wide

Data Use by PA Monitors

1. Education
2. Problem ID
3. Watershed planning
4. Non-point assessment
5. Restoration evaluation
6. Research
7. Waters classification/standards

Step 3: How will you use the Data Collected?

Match your monitoring purpose to your data users.

Potential Data Users

- *Watershed group & volunteer monitors*
- *Municipalities*
- *State agencies for use in the 305(b) report and enforcement of 303(d) list*

The CVMP Study Design Manual suggests four broad purposes for monitoring in PA:

Purpose A: Community Education and Awareness
Purpose B: Baseline Data Collection/ Stewardship
Purpose C: Community and/or Watershed Level Assessment
Purpose D: State and Federal Agency Assessment

Tier B: Stewardship

Data User

- Participants
- Watershed residents
- Landowners
- Local decision makers (optional)

Data Use

- Understanding of existing conditions and how any changes over time
- Screen for and identify problems and positive attributes

Quality Needed

- Low to medium rigor
- Variety of study designs is acceptable
- Training Formal/Informal
- Internal QAPP recommended

Tier B: Eyes of the Watershed

The Health of Pompeston Creek, Your Local Watershed

Question: How does Pompeston Creek's water quality impact me?

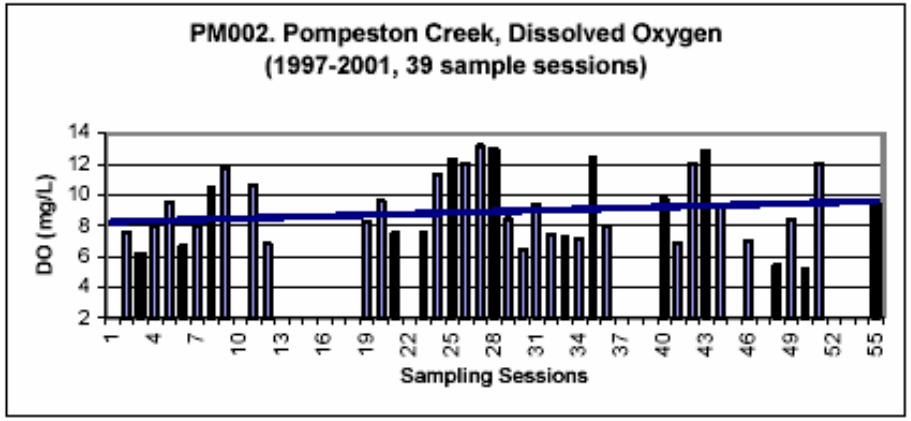
Answer: The Pompeston Creek sits on two heavily used groundwater aquifers and flows into the Delaware River approximately 1.5 miles from the surface water intake for NJ American Water Company in Delran, NJ. **It's part of your drinking water!**

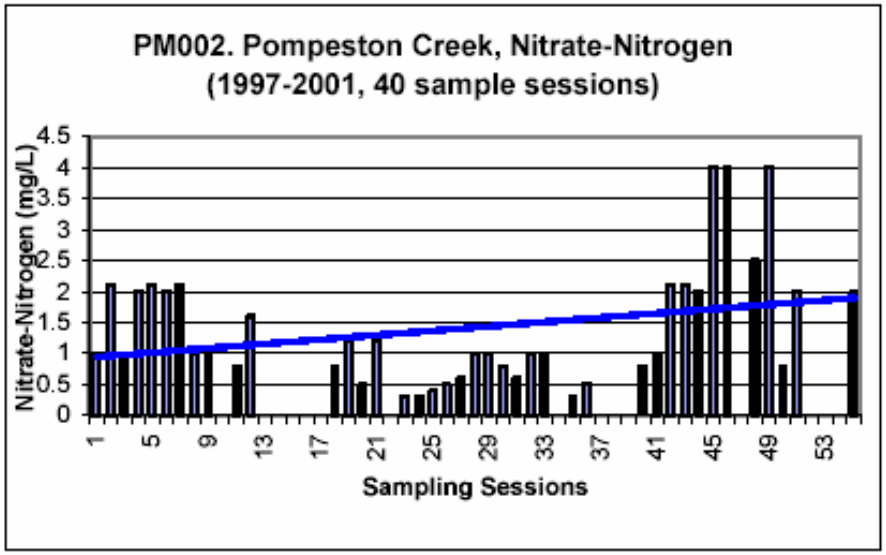
Question: What do the data indicate?

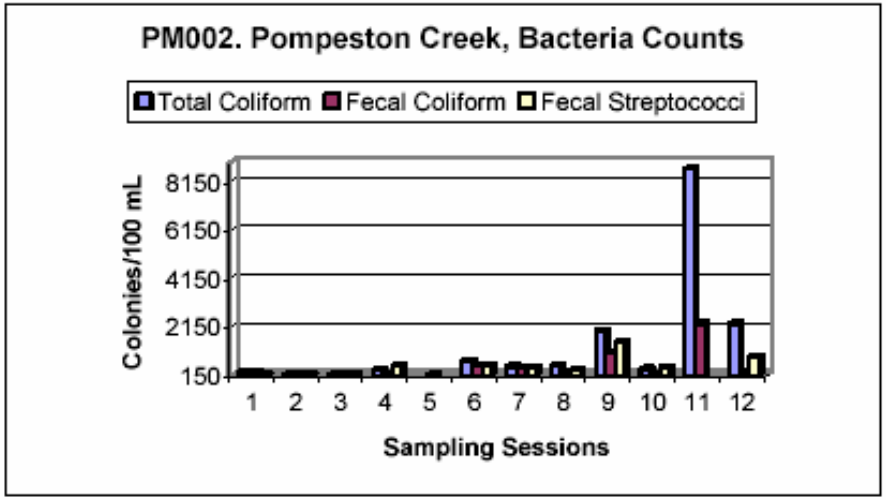
Answer: The data, collected by PCWA volunteer monitors, illustrate a general increase in nutrients over the 40 sampling sessions on record and high bacteria counts are also documented.

Question: What can I do?

Answer: Join the Pompeston Creek Watershed Association (PCWA) and help this grass-roots citizen group improve the Pompeston! Contact Debbie Lord, PCWA President at dglord@aol.com to get details on the next upcoming meeting.



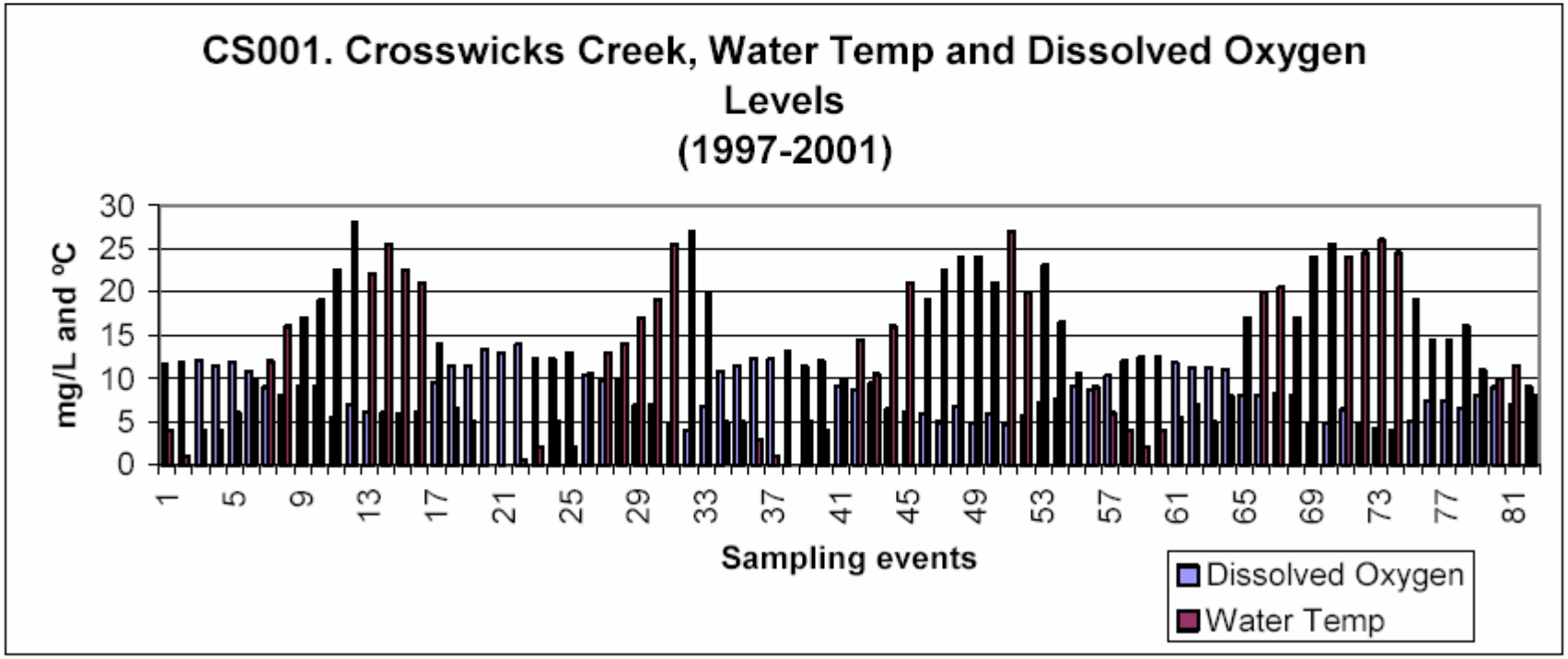




Healthy streams have nitrate-N levels less than 1.0 mg/l and bacteria counts should be no greater than 200 Col/100 ml for swimming. Over-fertilized lawns and golfcourses, yard waste dumped in streams, leaky septic systems, and STPs are several sources where this pollution may be originating.

What Can You Do To Help Crosswicks Creek? For starters…

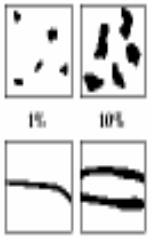
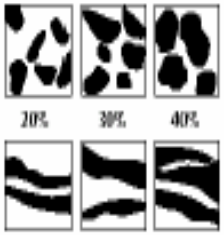
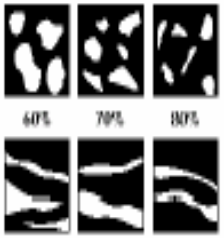
- ✓ Maintain a wide vegetated buffer of trees and shrubs next to your stream. This helps filter out excess nutrients and shade the stream.
- ✓ Minimize use of fertilizers and be sure to test soils before applying soil amendments
- ✓ Reduce water runoff and conserve water by placing a rain barrel to catch water from your down spouts….use water for gardens and flowerbeds
- ✓ If you have a septic tank, be sure to have it pumped regularly to protect your well and Crosswicks Creek
- ✓ Join the Crosswicks Creek Watershed Association and help your neighbors and community protect your local environment. Contact Charles Fisher at chashifisher@aol.com for more information or to join him on a monthly monitoring session



Athos I Oil Spill on the Delaware River, Nov 2004

Visual Assessment Protocol

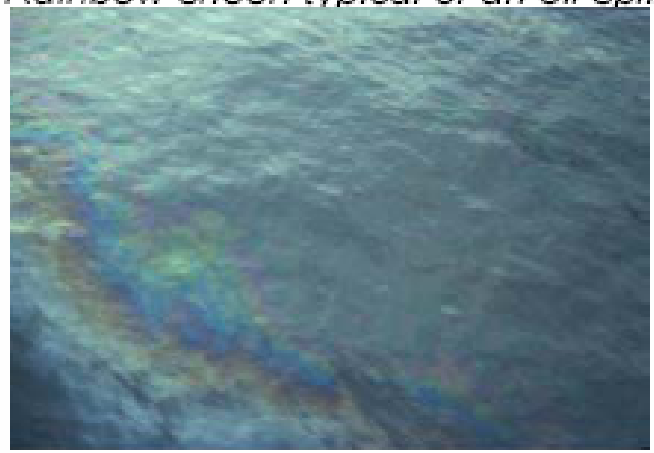
Oil spill impacts observed? ❑ Y; ❑ N; If yes, approximate length & width of impact: Length _____ Width _____

Impacted Habitat Types and Materials: **Check all habitat types or materials present**	No Impact or Trace (<1%)	Sporadic 1-10%	Patchy 11- 50%	Broken 51 - 90%	Continuous 91- 100%
					
Water					
Marsh/Swamp					
Tidal Flat					
Sand or Shell Beach					
Dune					
Rip-Rap (large rock used as to prevent erosion)					
Bulkhead, Manmade Structures					
Other Vegetation					
Other (describe)					

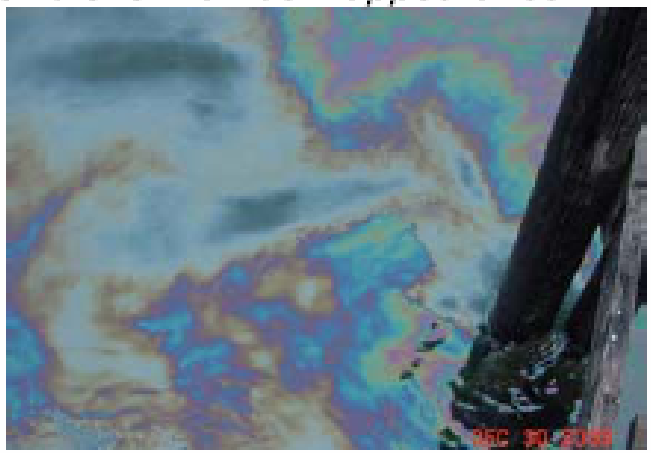
Oil Spill Containment

Sorbent boom at spill site.

Rainbow sheen typical of an oil spill.

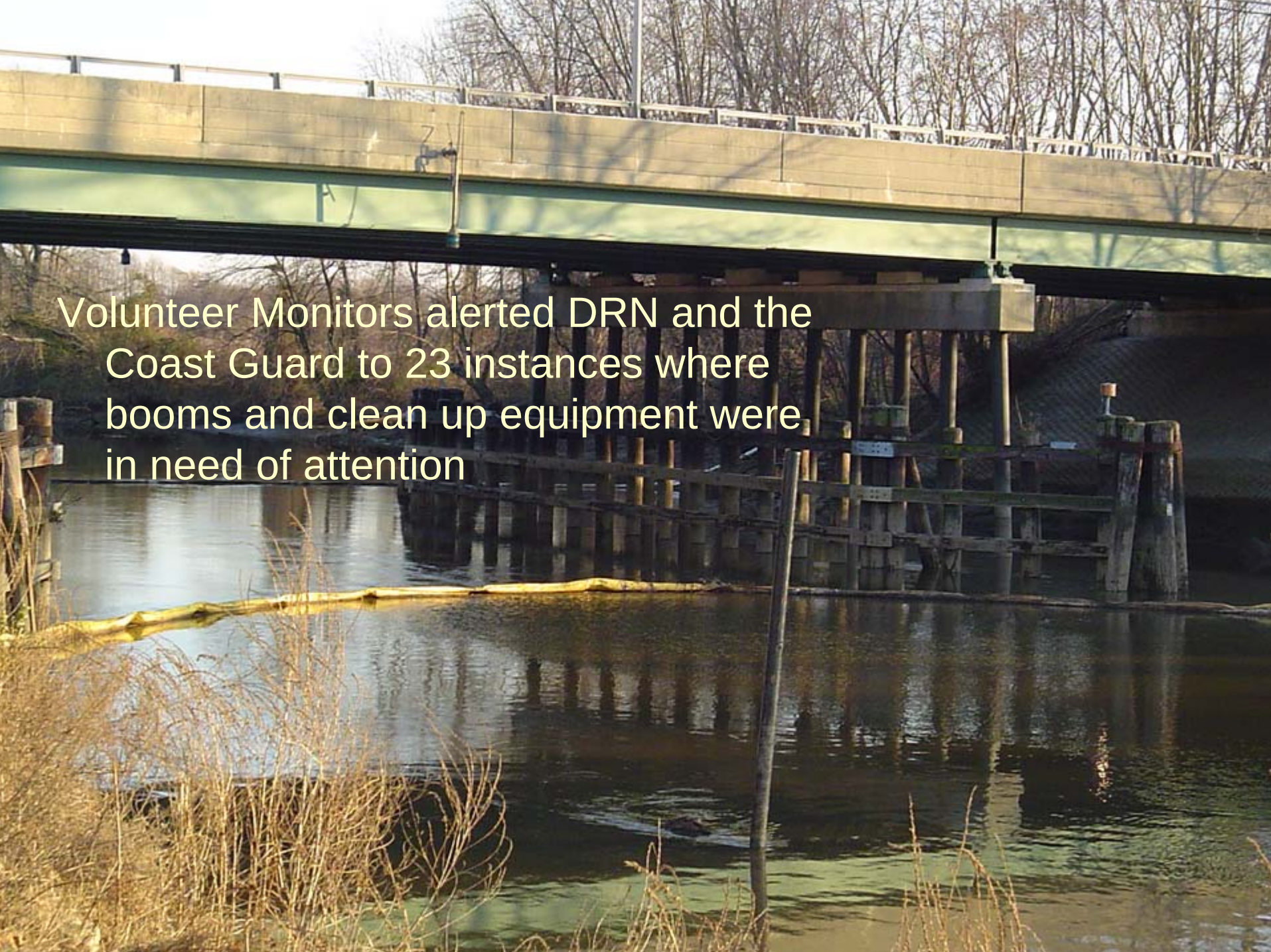


Unbroken rainbow appearance.



Oil in creek along streambank.

Oil stains at low tide.



Volunteer Monitors alerted DRN and the Coast Guard to 23 instances where booms and clean up equipment were in need of attention

Volunteers alerted officials of shoreline oiling at > 30 locations

57 miles of shoreline oiled

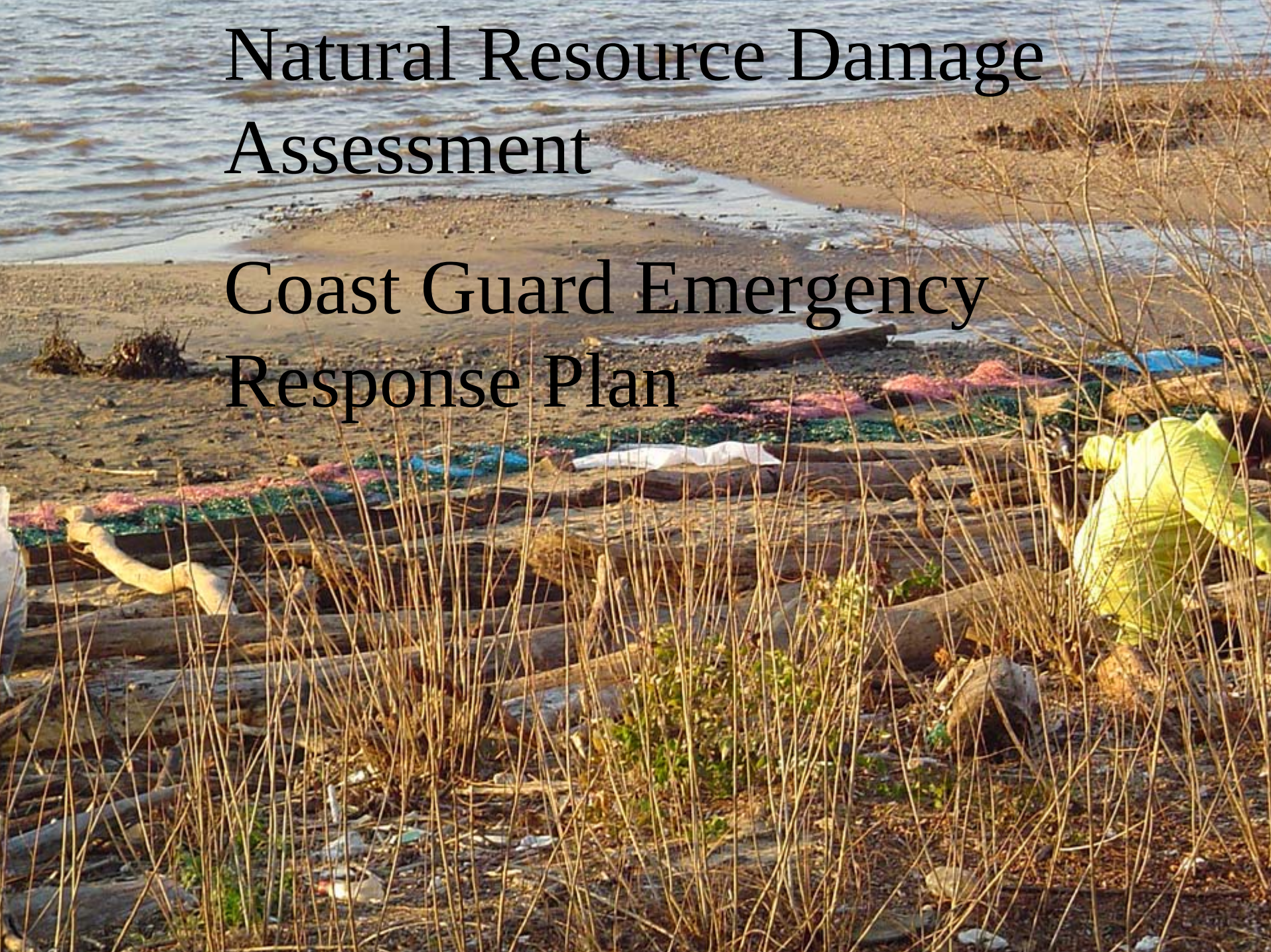
Oiled Wildlife

- **Monitors documented oiled birds in the field & contacted FW Monitors**
- **Reported: 383 birds cleaned and released**

182 birds dead from oil spill…

Natural Resource Damage Assessment

Coast Guard Emergency Response Plan



Protecting High Quality Watersheds

- Ensure special protection is enforced
- Ensure water quality does not degrade by long-term monitoring (Schuylkill Project)
- Monitor new developments/ impacts

EV Watershed

Stopping Bad Projects in High Quality Watersheds

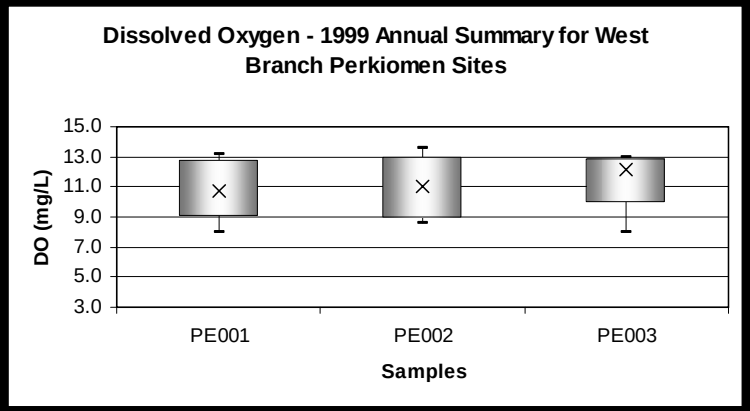
- C1 watershed protection
- Volunteer data and USGS historic data
- Testimony at public hearings

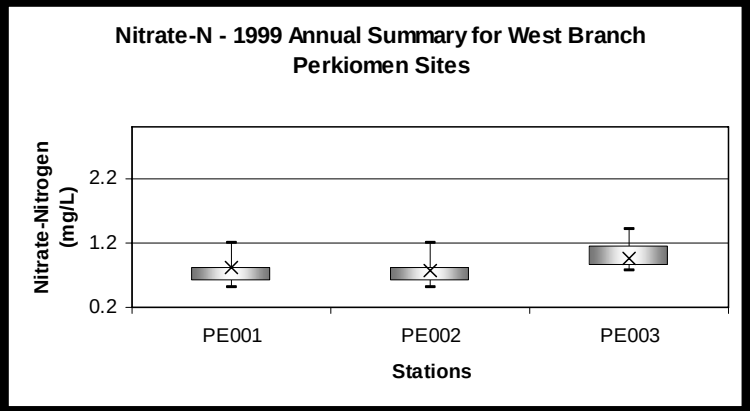
Maiden Creek Watershed Assoc.

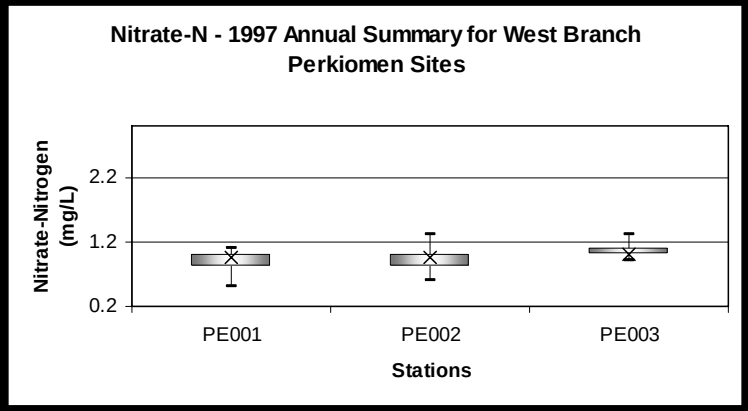
- CAFO under review
- Used monitoring data at public hearings to reinforce concerns
- Alerted BCCD of existing agric. Pollution
- Buffer established
- Albright College partnership

Sewage Treatment Plants and Water Quality

When the Sewage Treatment Plant is not the bad guy…..







Restoring Streams…

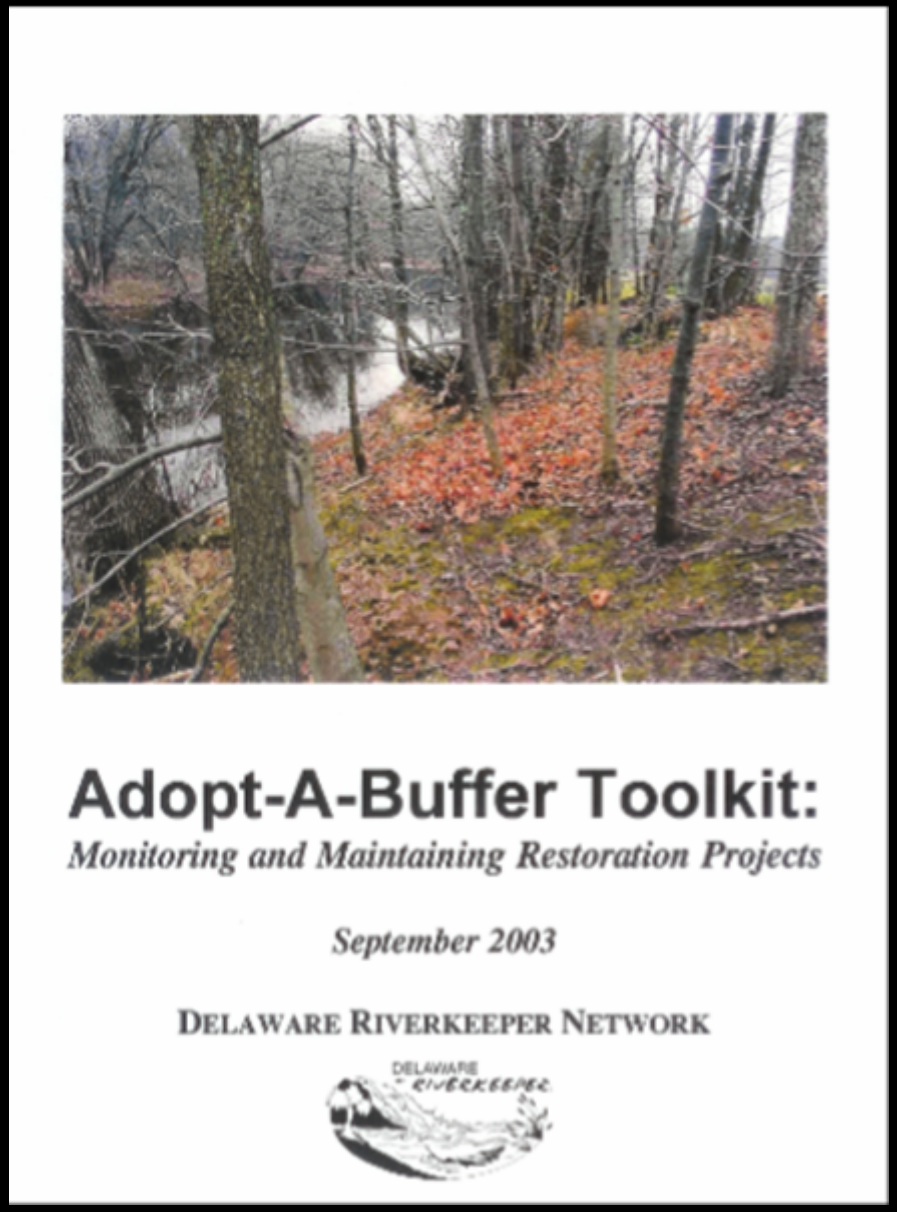
Restoration Monitoring Menu

Level 1 Techniques

- Photo monitoring
- Restoration Project Survey

Level 2 Techniques

- Cross sections
- Bank Pin Monitoring
- Macroinvertebrate Monitoring
- Wildlife Habitat



Project Impacts:

- Plant Damage Survey

Plants installed have been damaged by:			
Type of Impact	**Approx. % of Plants/ # of Species Damaged**	**Comments/Description**	**Spot Photos**
Herbivory (indicate deer or rodent damage)			
Girdling of trunk (rodent damage or deer rub) Fungus/Disease/Leaf Die Back Mowing or other man-made practices Flood/storm damage (uprooted plants) Invasive plant competition			
Poor planting technique			
Unknown/Other:			

Additional Comments: _____

Plant Disease

Improper Mulching

Deer herbivory

Tracking & controlling exotic plants

Manatawny Creek
Post-Dam Removal

Purple Loosestrife
Control Survey

Overall Project Reach
(Blue lines indicate project reach boundaries.)

Photo Documentation Plots

- Potential for invasion
- Sparse plants in bare open areas
- Sparse plants w/ competing vegetation
- Aggressive or scattered colonies
- Monotypic stand

100 0 100 200 300 400 Feet

N

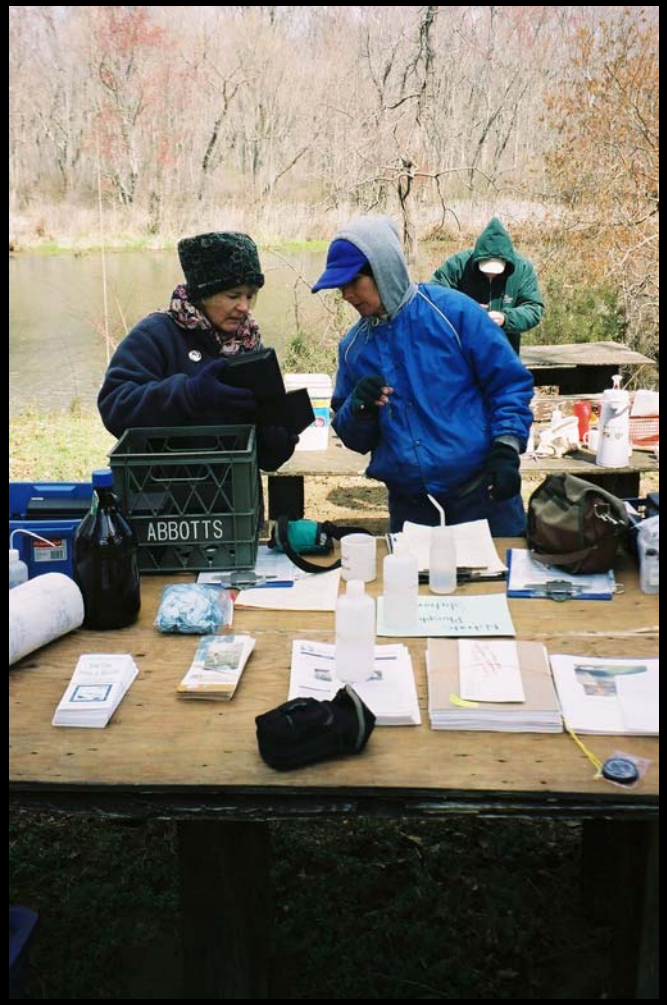
DELAWARE RIVERKEEPER

Adopt-A-Buffer Stats.

- 40 restoration project sites monitored
- 15 sites receiving maintenance action due to monitoring results
- New improved restorations build on results

WAR on Turf Grass…Cooper

- 70 million pounds of chemicals applied to lawns each year- and growing
- Monitoring detected 132% increase in phosphates
- Door hangers; water bill pamphlet – message – watershed friendly lawn care



Tier C: Community &/or Watershed Assessment

Data Users

- Local decision-makers
- Watershed association
- Environmental organizations
- Possibly DEP

Data Use

- Assess current conditions
- Track trends
- Source track down of Nonpoint source pollution

Quality Needed

- Medium/high level of rigor
- Data needs to reliably detect changes over time & space
- QAPP approved & on file w/ intended data user.
- Training required

WANTED!

YOUR PROJECT IDEAS FOR THE NESHAMINY!

- Stream and Riparian Restoration
- Purchase Land for Conservation
- Build a Park or Playground
- Build or Enhance a Trail
- Investigate New River Access
- Plant Trees or Restore Wetlands
- Protect & Restore Historic Area

The Delaware Riverkeeper Network needs project ideas from non-profit organizations and municipalities to include in the Rivers Conservation Plan. Upon completion and approval of the plan, the Neshaminy Creek can be listed on the State Rivers Registry. Those organizations whose project ideas, whether specific or general, are listed in the plan will have the opportunity to apply for matching funds through the PA DCNR Grant Program. Last year DCNR gave ***$1.4 MILLION*** *for Rivers Conservation Plans and Projects. We want to include* ***YOUR*** *project in the plan. However big or small, please contact Riverkeeper with your project idea (contact info. on right). We are planning to finish the plan by the winter of 2001. For further information on DCNR grants, access the following web site:* ***www.dcnr.state.pa.us/grants.htm***

THE UPPER AND MIDDLE NESHAMINY RIVER CONSERVATION PLAN

The River Conservation Plan will help to Enhance, Protect and Restore Natural, Cultural, Historic and Water Resources throughout the Upper and Middle Neshaminy Creek Watershed.

Contact Information
Contact: Tracy Carluccio
P.O. Box 326
Washington Crossing, PA 18977
Phone: (215) 369-1188
Fax: (215) 369-1181
Email: tracy@delawareriverkeeper.org
www.delawareriverkeeper.org

Dam Removal Project

Ridley Creek Watershed Assessment

- 80 stream miles surveyed – 2 mile segments
- Trained team leaders and volunteers

Pennsylvania Environmental Council

RIDLEY CREEK VISUAL ASSESSMENT SURVEY

Evaluator's name_____**Phone #:**_____
Stream segment#:_____ **Subsegment #** _____**Date:** _____
Length of Subsegment (minimum 300') _____
Location Description:_____

Surrounding Land Use (Total 100%):
row crops_____**meadow/hayfield**_____**grazing/pasture**_____**forest**_____
residential_____**commercial** _____**industrial**_____**other** _____

Gradient (Low<2%, Med 2-4%, High>4%):_____ (2% = 2' fall over 100' length)
Active Channel Width (feet):_____**Average Depth (feet):**_____
PRESENT WEATHER CONDITIONS:_____**PAST 2-5 DAYS:**_____
Water Appearance:_____ **Water Odor:**_____
Clear, Milky, Foamy, Turbid, Oily Sheen, Other None, Sewage, Chlorine, Fishy, Other

	BEDROCK	BOULDER	COBBLE	GRAVEL	SAND	SILT	CLAY
DOMINANT SUBSTRATE							
SUBDOMINANT SUBSTRATE							

Boulder = >10" Cobble= 10" - 2" Gravel= 2" - .1" Sand= .1" - .02" Silt= fine grit Clay= smooth, almost greasy

ASSESSMENT SCORES (1-10): **Comments:** (use back for additional notes)

Buffer Width (left bank) _____ _____

Buffer Width (right bank) _____ _____

Canopy Cover _____ _____

Terrestrial Habitat _____ _____

Bank Stability _____ _____

Channel Conditions _____ _____

Riffle Embeddedness _____ _____

Fish Habitat _____ _____

Invertebrate Habitat _____ _____

Macroinvertebrates _____ _____

TOTAL POINTS	
NUMBER OF CATEGORIES SCORED	
POINTS DIVIDED BY # OF CATEGORIES = OVERALL SCORE	

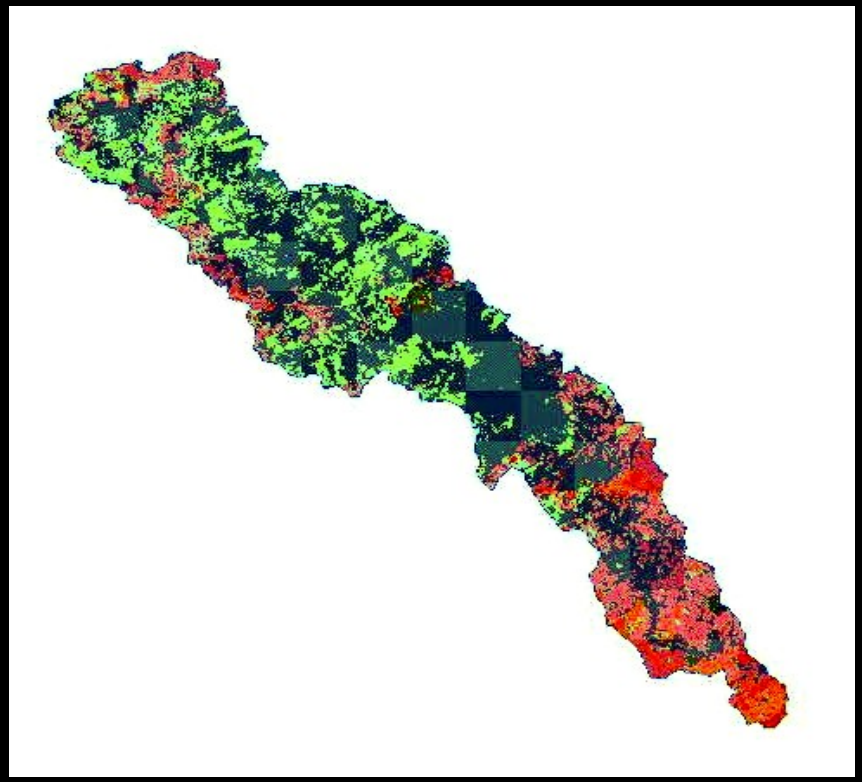
<6.0 Poor; 6.1-7.4 Fair; 7.5-8.9 Good >9.0 Excellent

Ridley Creek Assessment

Assessment Findings Legend

- Excellent (Greater than 9)
- Good (7.5-8.9)
- Fair (6.1-7.4)
- Poor (less than 6)
- Unassessed

Ridley Creek Results



- Restoration sites identified/prioritized/ implemented
- GIS layers available with landuse and stream rating
- Awareness raised
- Partnerships made

Using Data for Stream Upgrades

- Hay Creek
- French Creek
- Pickering Creek
- Hosensack Creek
- Delaware River Wild & Scenic River-NJ Tributaries

Stormwater Retrofit Surveys

- Windshield surveys
- Basin monitoring
- Characterize watershed using GIS
- Identify/implement basin retrofits

Tier D: Indicators & Regulatory Response

Data Users

- NJDEP
- Local decision-makers
- Watershed associations
- Environmental organizations

Data Use

- Assess current conditions and impairments
- Supplement agency data collection
- Research
- Evaluate best management practices (BMP) measures
- Regulatory Response

Quality Needed

- High level of rigor
- Study design & methods need to be equivalent & recognized by agencies using data
- Training required
- QAPP approved by Office of Quality Assurance & data user, annual recertification
- Possible audit

Tier D: 305(b)/303(d) Purposes

- Minimum of 24 samples
- Often sophisticated equipment needed
- EPA-Approved Study Design, QAPP, or QA/QC Plan Required
- Macro data – ID to family level
- Lab analysis

Tier D: Volunteers assist PA DEP

- Bacteria Monitoring Project
- Lake Monitoring Project

Litigation

Otter Creek Temperature Data…who knew…..

Species	Max. weekly average temp. for growth (juveniles)	Max. temp. for survival of short exposure (juveniles)	Max. weekly average temp. for spawning [a]	Max. temp. for embryo spawning [b]
Atlantic salmon	20°C (68°F)	23°C (73°F)	5°C (41°F)	11°C (52°F)
Bluegill	32°C (90°F)	35°C (95°F)	25°C (77°F)	34°C (93°F)
Brook trout	19°C (66°F)	24°C (75°F)	9°C (48°F)	13°C (55°F)
Common carp	---	---	21°C (70°F)	33°C (91°F)
Channel catfish	32°C (90°F)	35°C (95°F)	27°C (81°F)	29°C (84°F) [c]
Largemouth bass	32°C (90°F)	34°C (93°F)	21°C (70°F)	27°C (81°F) [c]
Rainbow trout	19°C (66°F)	24°C (75°F)	9°C (48°F)	13°C (55°F)
Smallmouth bass	29°C (84°F)	---	17°C (63°F)	23°C (73°F) [c]
Sockeye salmon	18°C (64°F)	22°C (72°F)	10°C (50°F)	13°C (55°F)

[a] Optimum or mean of the range of spawning temperatures reported for the species
[b] Upper temperature for successful incubation and hatching reported for the species
[c] Upper temperature for spawning

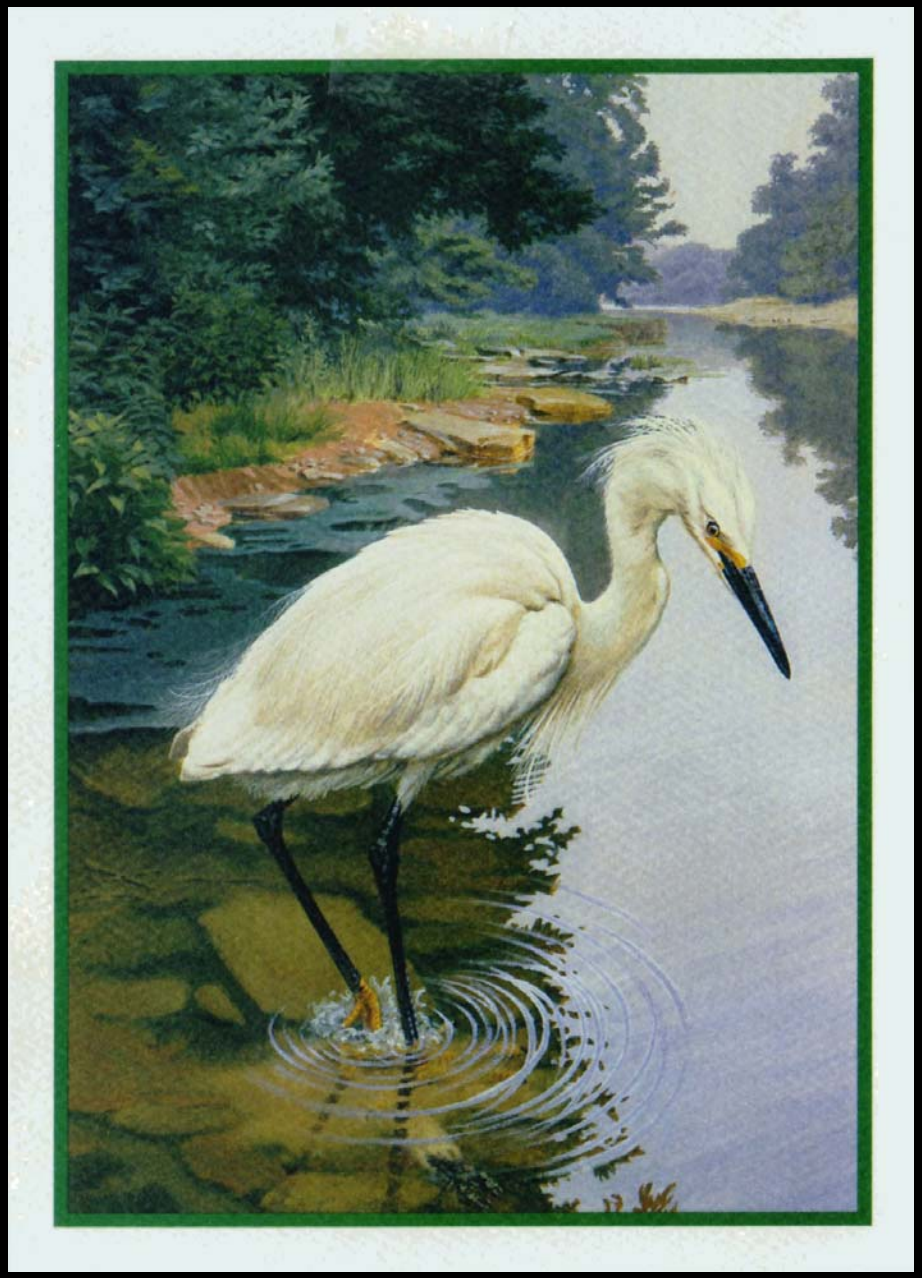
(Brungs and Jones 1977)

Gaining Empowerment

- Chiyoda, Inc.
- Knowledge-concern-action
- $75,000 in fines

What leads to action??

- Clear goals and issues outlined up front—folks want answers
- A good monitoring coordinator
- Partnerships with other concerned entities to receive technical advice
- Monitor program linked with advocates/spokespeople – group diversity



“Never doubt that a small group of thoughtful, committed citizens can change the world. Indeed, it’s the only thing that ever has.”

--Margaret Mead