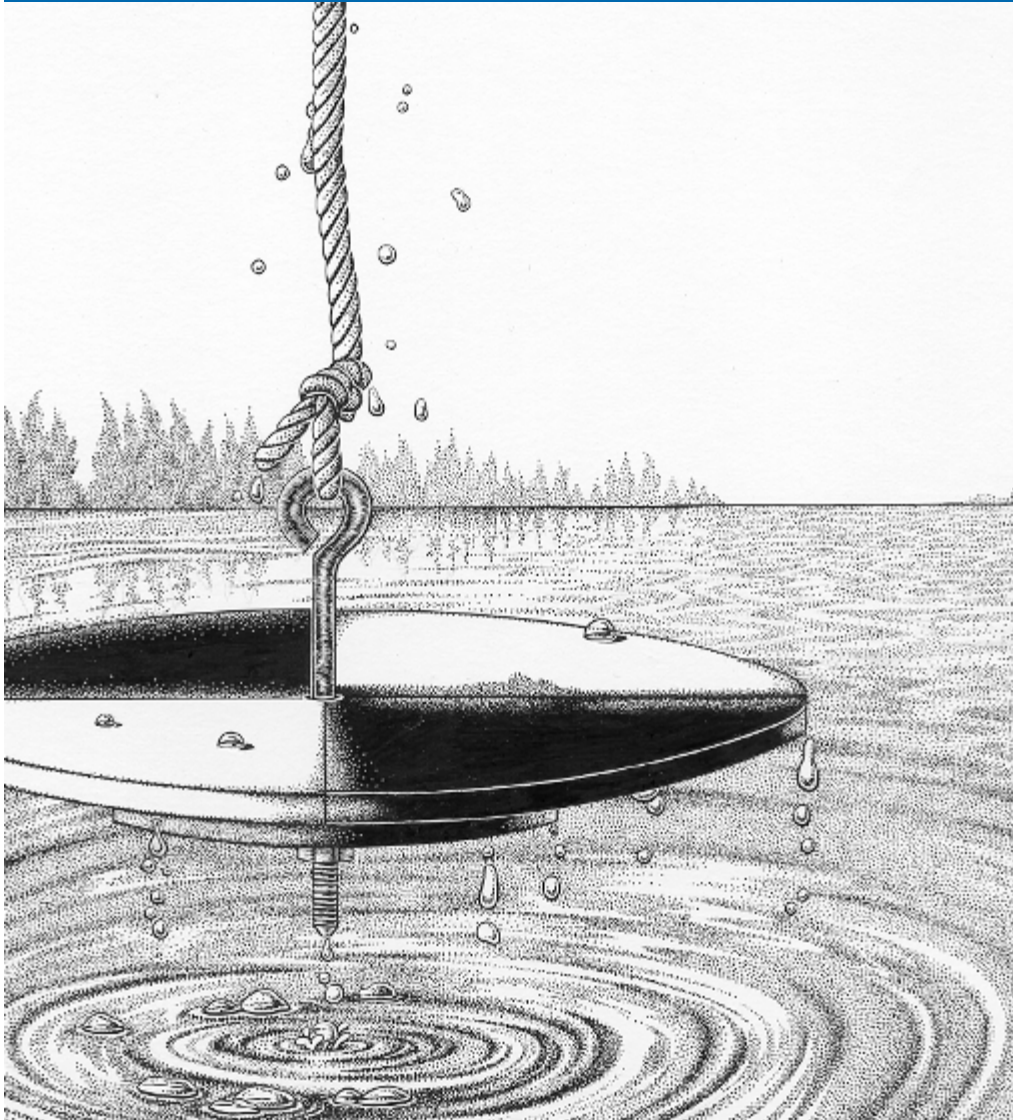


# The Ripple Effect of Volunteer Monitoring



**Linda T. Green**  
URI Watershed Watch Program  
URI Cooperative Extension  
CSREES Volunteer Water Quality  
Monitoring Project

~~~~~  
**Michigan Statewide Volunteer  
Monitoring Conference**  
October 2008

# Volunteer Monitoring Makes A Difference

- 💧 Raises awareness, and educates
- 💧 Involves people in real science
- 💧 Gets people to care
- 💧 Creates an informed constituency
- 💧 Provides info on places where no one else is looking
- 💧 Identifies & solves problems locally



# Volunteering: a Great American Habit\*

- ◆ 44% of Americans volunteered in '01
  - ◆ 39% scheduled (weekly, biweekly)
  - ◆ 41% sporadic, one-time
- ◆ 3.5 hours per week
- ◆ Comparable to:
  - ◆ 9 million fulltime employees
  - ◆ \$239 billion in total value

**= \$19.51 hourly wage in '07**



\* [www.IndependentSector.org](http://www.IndependentSector.org)

# Pioneering Programs

- ◆ Birds Hitting Lighthouses (1880's)
- ◆ National Weather Service (1890)
- ◆ National Audubon Society (1900)
- ◆ National Marine Fisheries Service (1954)
- ◆ Stream Monitoring - (Maryland - 1969)
- ◆ Lakes - (ME, MN, Michigan, NH) – '71-'78
- ◆ Estuaries – RI, Chesapeake Bay (1985)



# Earlier Monitoring Efforts\*

- ❖ Lake Suwa, Japan
  - ❖ Lake freezing
  - ❖ Appearance of ice pressure ridge
  - ❖ Since 1541
- ❖ Lake Constance, Germany & Switzerland
  - ❖ Presence/absence of lake freezing
  - ❖ Since the 9<sup>th</sup> century

\*NALMS LakeLine, summer 2008



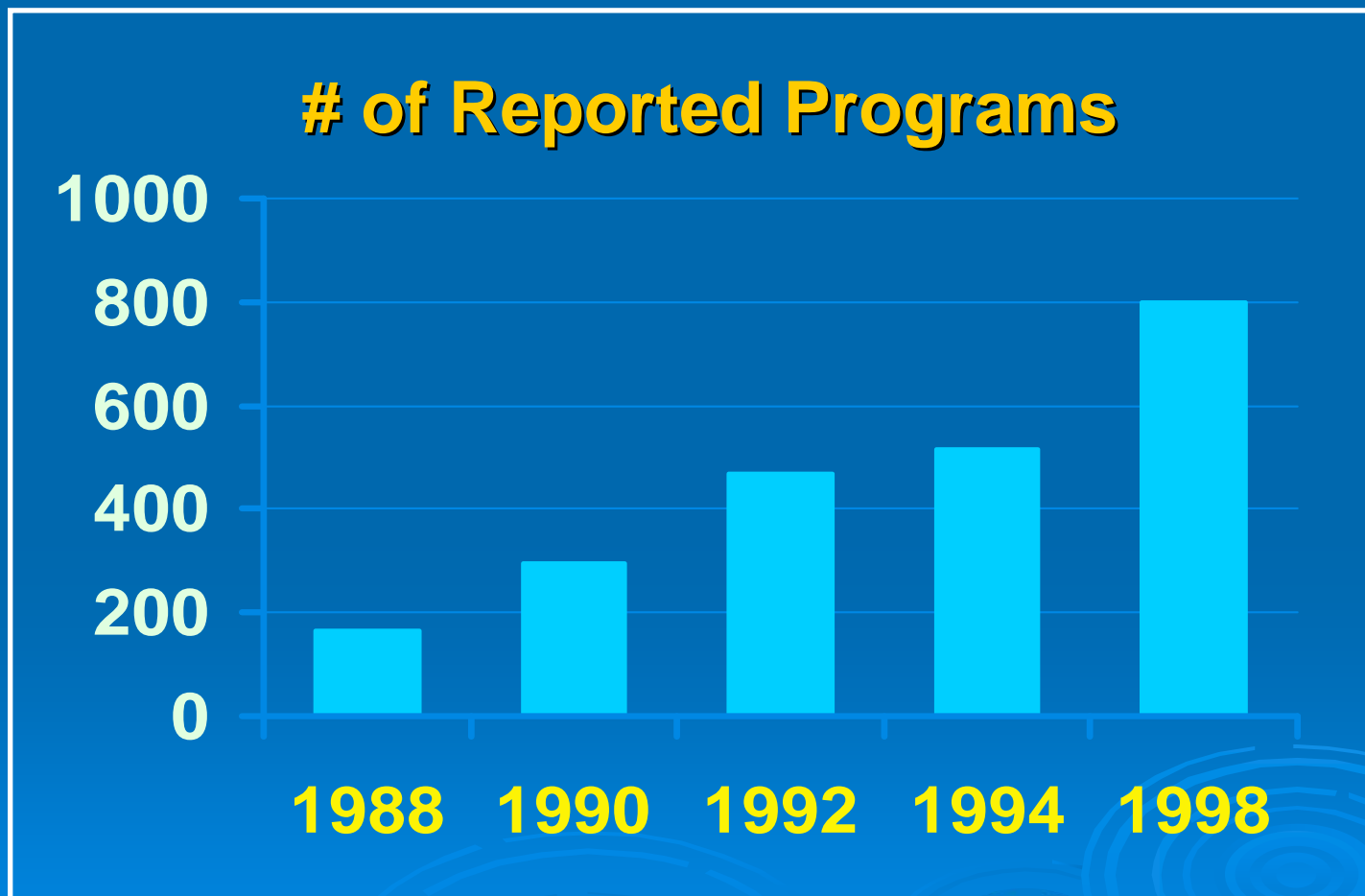
# Individual Monitoring Efforts: the Kozhov family legacy

- ❖ Lake Baikal, Russia
  - ❖ Water temp, clarity, plankton
  - ❖ to a depth of 2400'
  - ❖ Year round, every 7-10 days
  - ❖ Since 1945

\*NY Times 5/6/08



# US Volunteer WQ Monitoring Came of Age in the 1990s\*

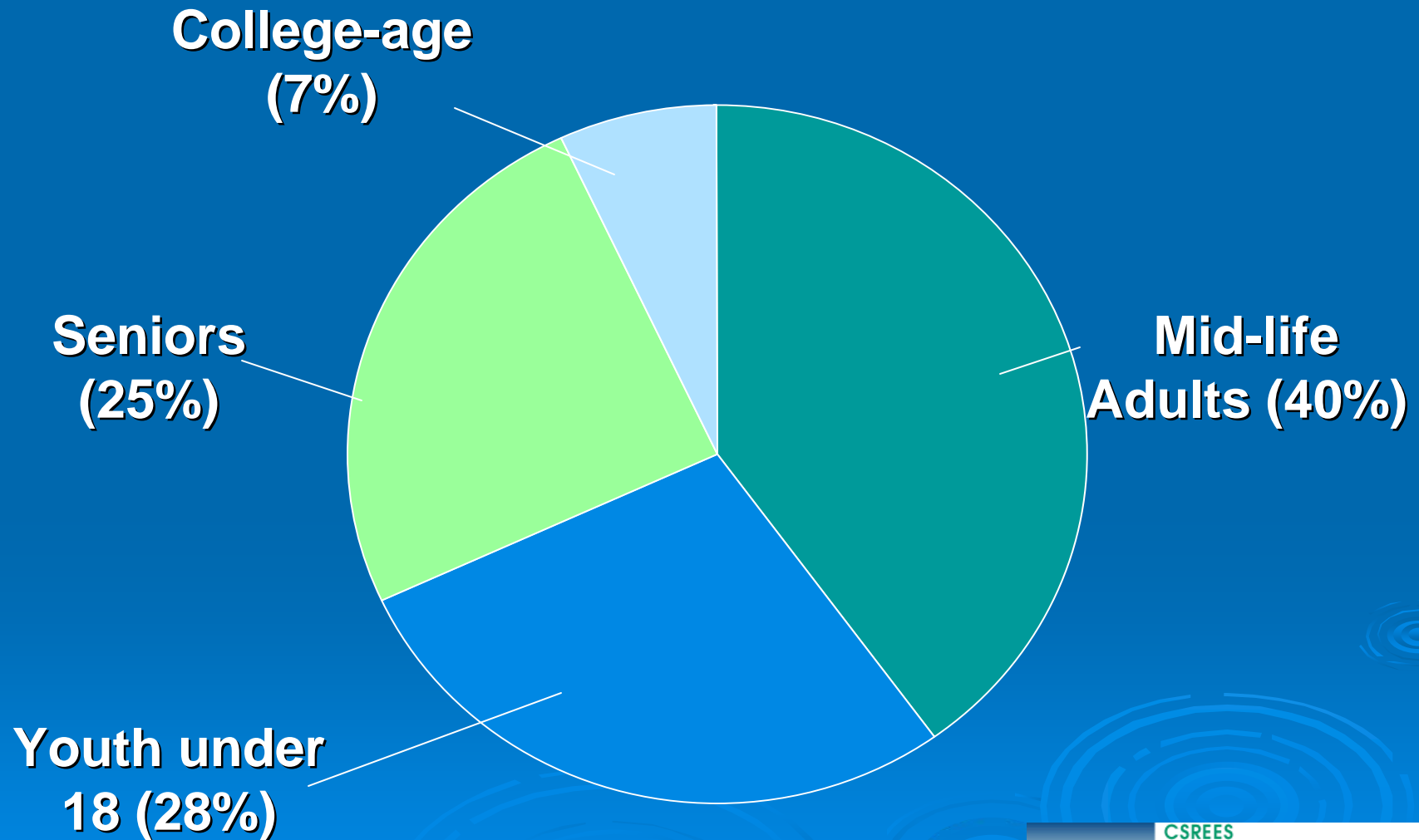


\* Nat'l Dir. of Envir. Mon. Progs. - 5th Ed.

*Current estimates:  
800 – 1200 programs*



# Who Are Our Volunteers?

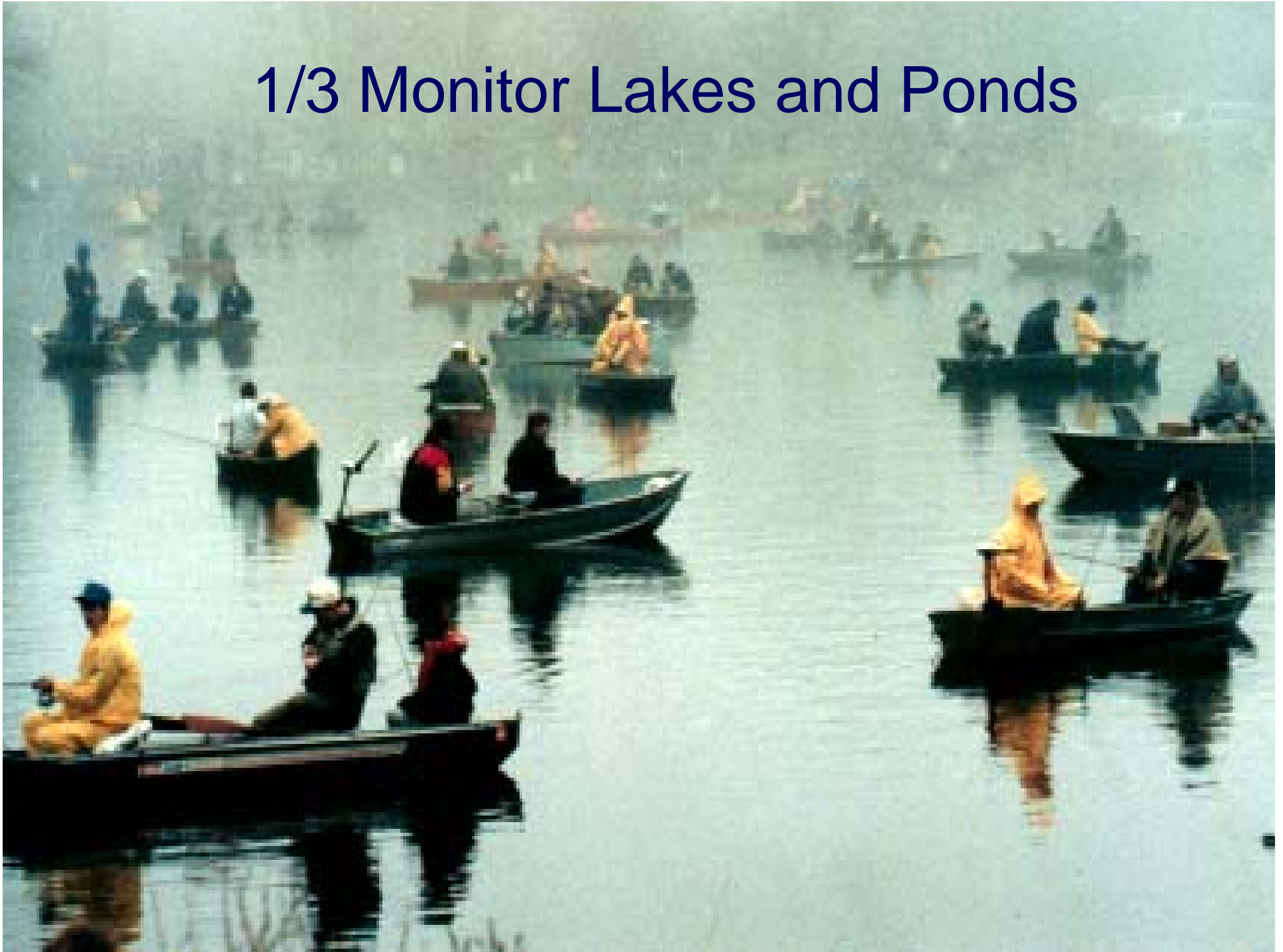


# 2/3 of Volunteer Programs Monitor Rivers and Streams

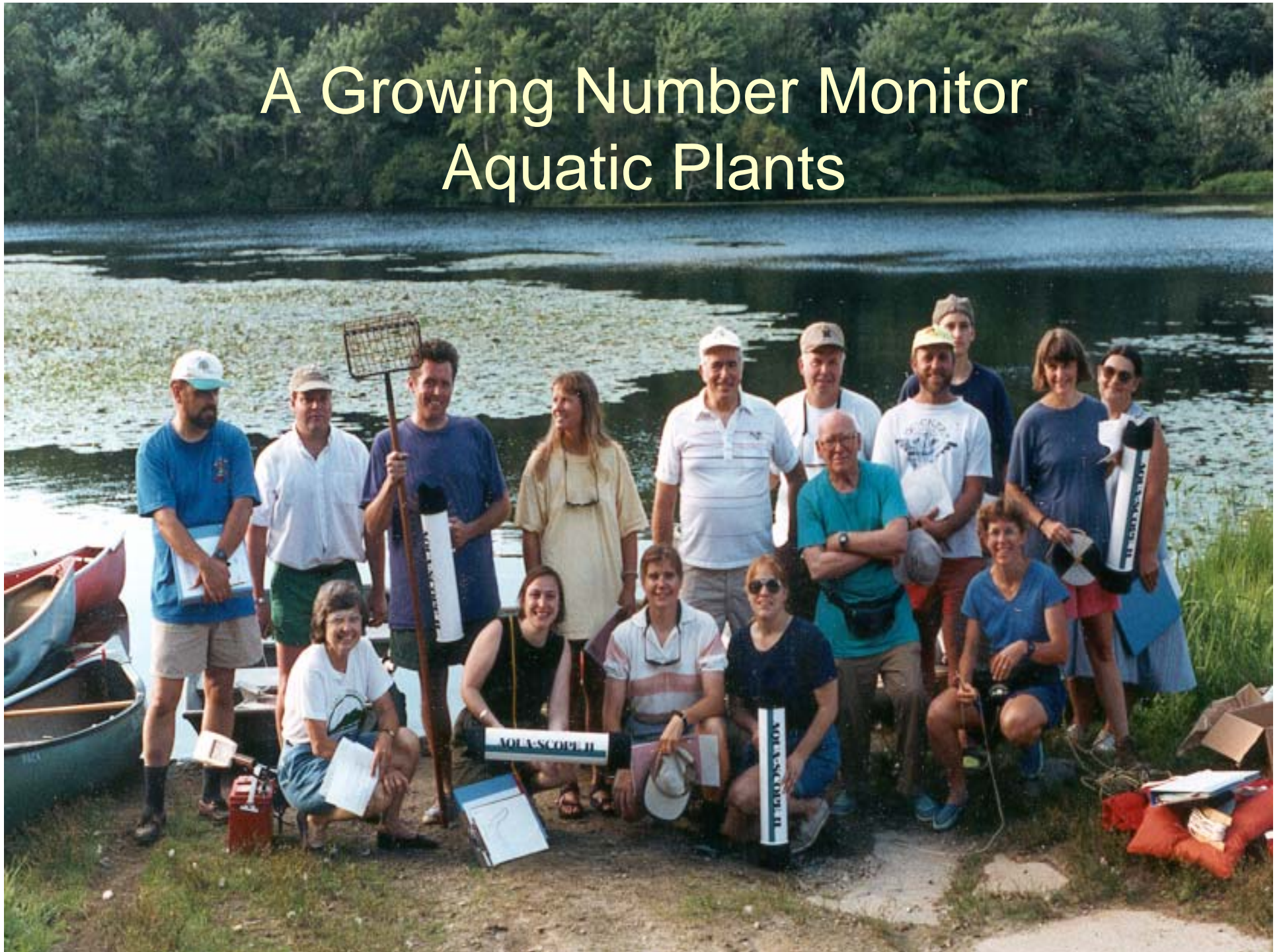


Photo: Joan Martin Huron River  
Watershed Coalition

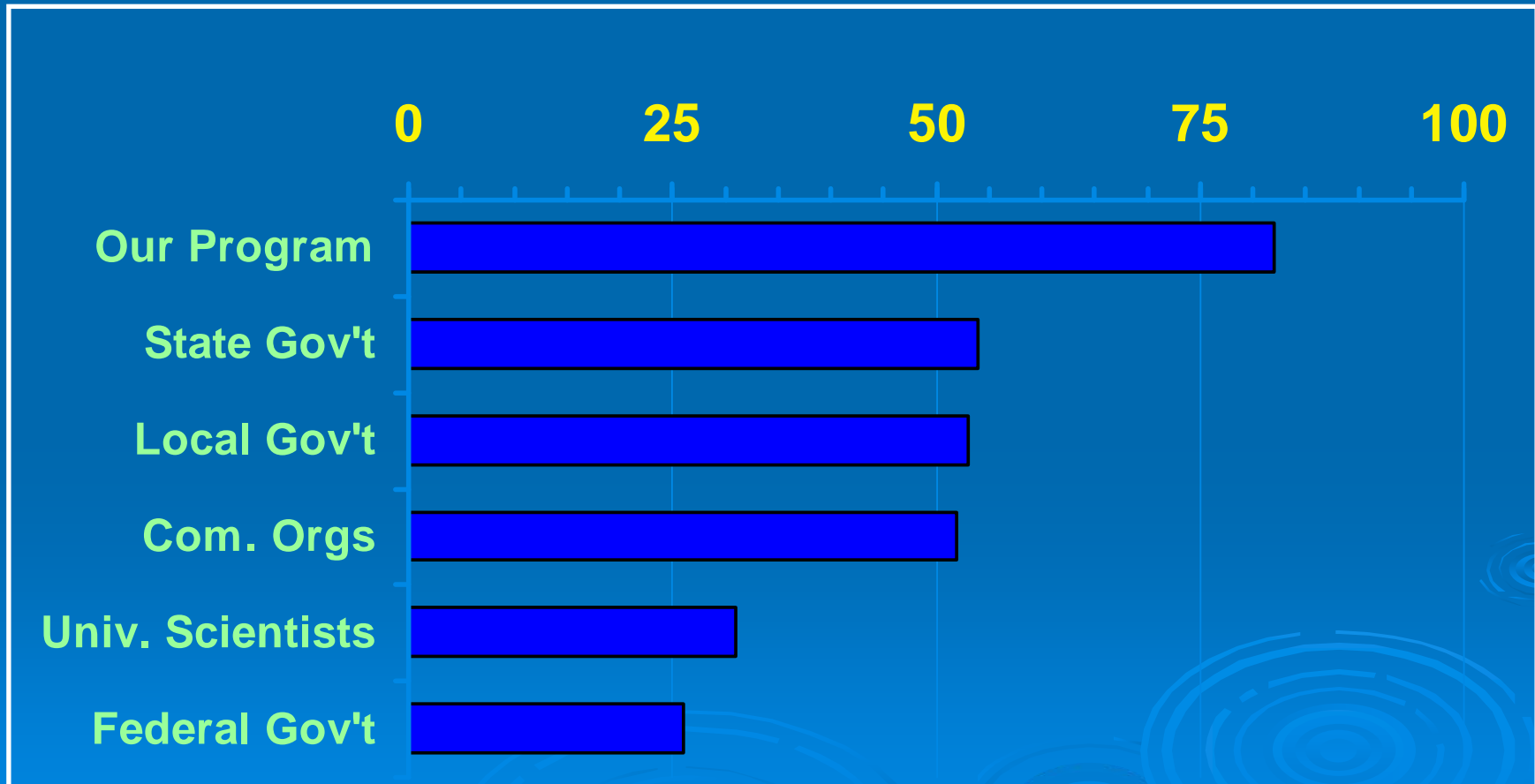
# 1/3 Monitor Lakes and Ponds



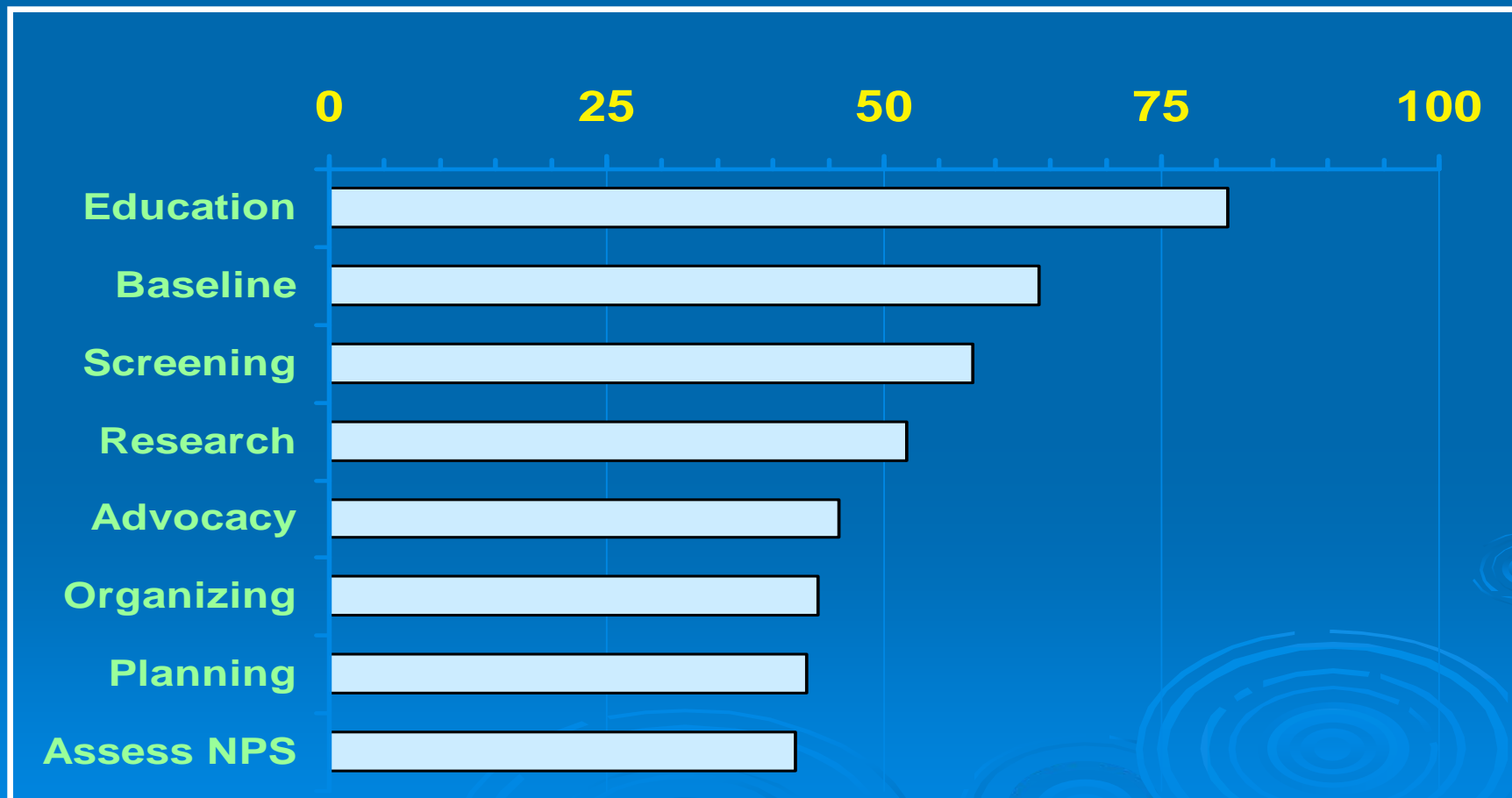
# A Growing Number Monitor Aquatic Plants



# Who is Using the Data



# How the Data is Being Used

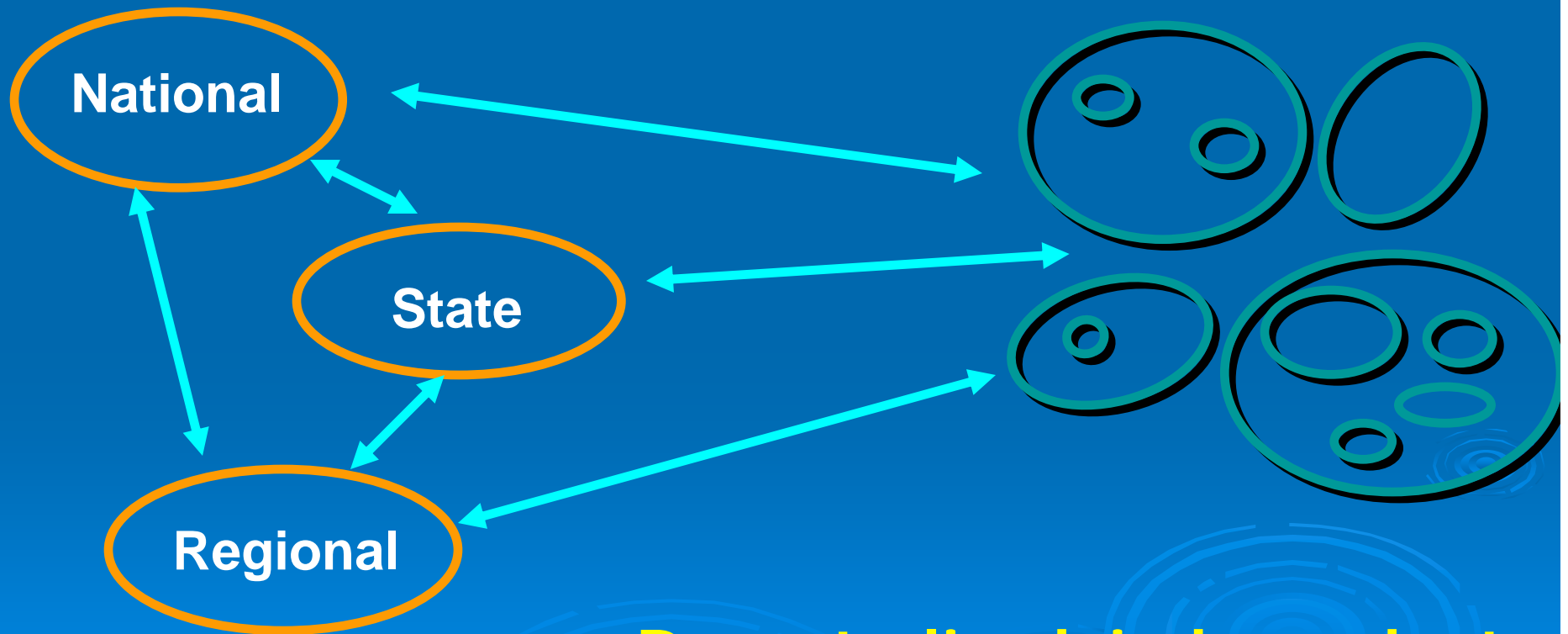


# The Volunteer Monitoring

“System”

Direct Service  
Providers

Monitoring  
Groups



Decentralized, independent

# Useful Sources for Programs

- 🟢 EPA guidance manuals
- 🟢 *The Volunteer Monitor* newsletter
- 🟢 LaMotte/Hach kits and catalog
- 🟢 Volunteer program websites
- 🟢 Volunteer monitoring listservs
- 🟢 Secchi Dip-In website (<http://dipin.kent.edu/>)



# USDA CSREES National Facilitation Project

[www.usawaterquality.org/volunteer](http://www.usawaterquality.org/volunteer)

- 💧 Build a comprehensive support system for (Extension) volunteer water quality monitoring efforts
- 💧 Expand & strengthen the capacity of existing (Extension) volunteer monitoring programs
- 💧 Support development of new groups

# Characteristics of Successful Volunteer Water Quality Monitoring Programs . . .

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



# A Sound Scientific Basis means...

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



National Facilitation Project factsheet:  
*Designing Your Monitoring Strategy*

# The Continuum of Monitoring Data Use



Education/  
Awareness



Problem ID,  
Assess  
Impairment,  
Local  
Decisions



Legal &  
Regulatory

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

Geoff Dates, River Network

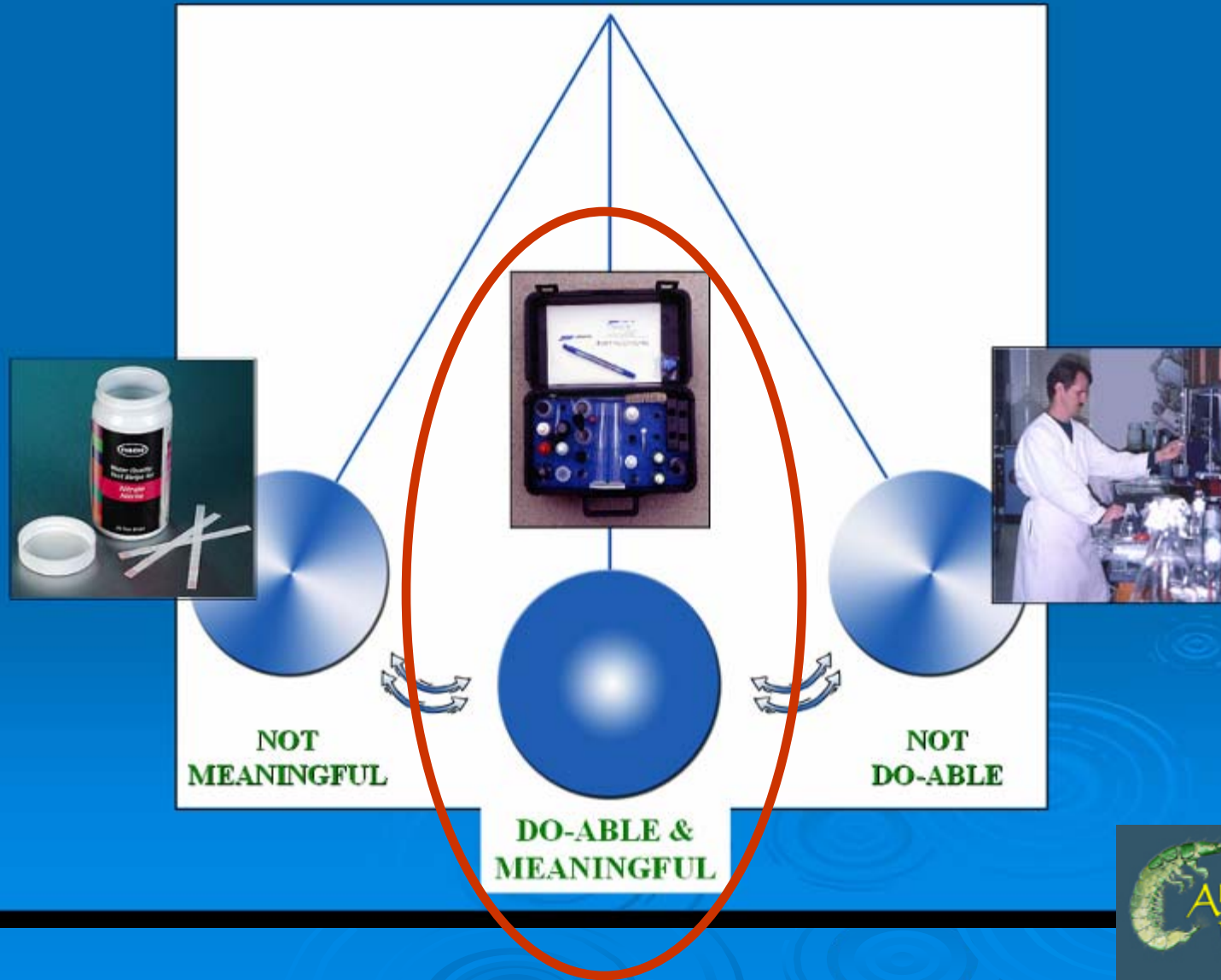
# New Jersey's Tiered Approach

- Tier A: Environmental Education
- Tier B: Stewardship
- Tier C: Community Assessment
- Tier D: Indicators/Regulatory Response

- Monitoring groups choose a tier according to their own program goals
- NJ DEP divisions also choose a tier according to their data needs



# The AWW Approach



# Top Parameters Lakes & Rivers

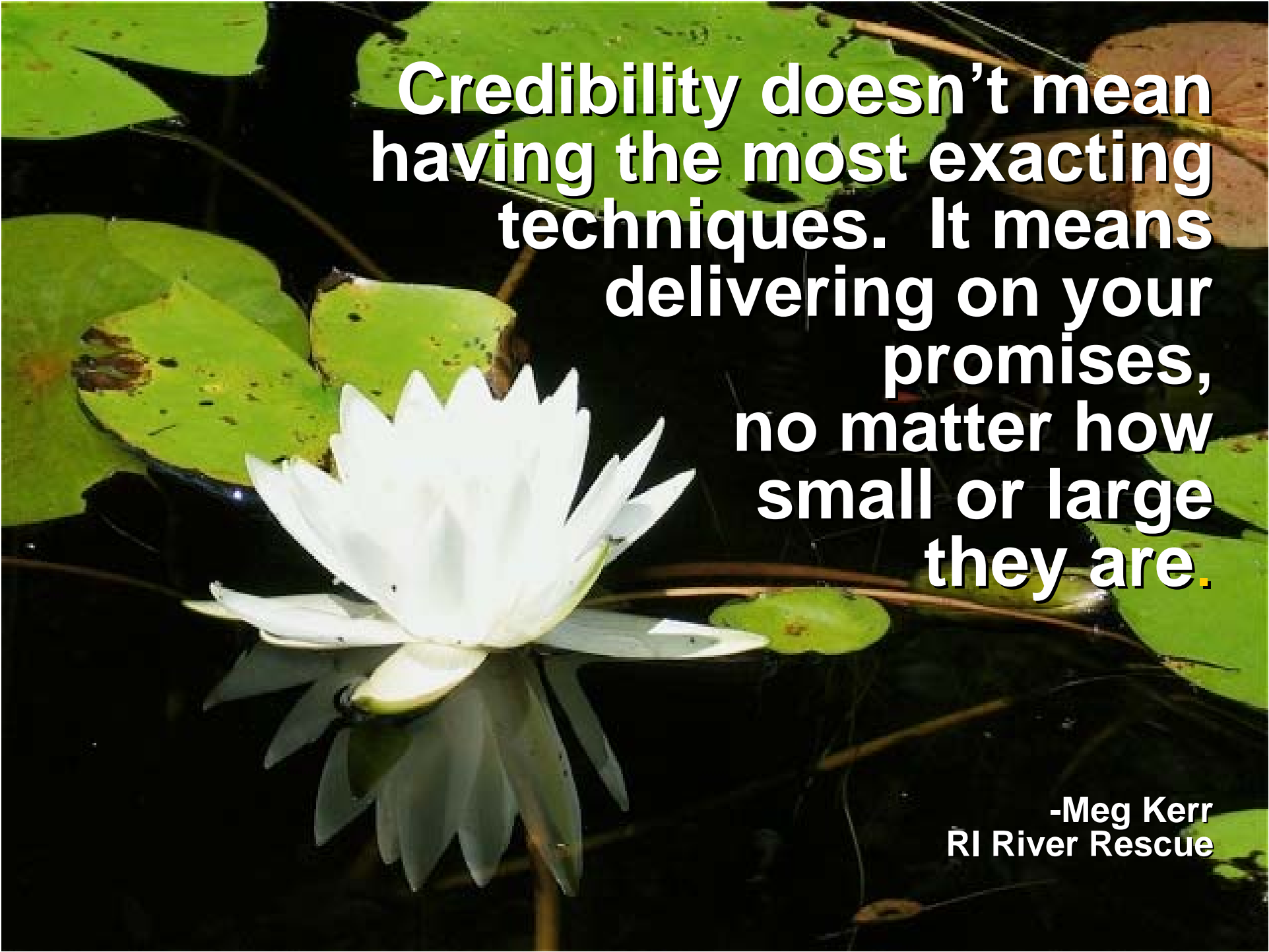
## River/Streams

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

## Lakes

- 💧 Secchi transparency
- 💧 Water Temperature
- 💧 Phosphorus
- 💧 Diss. Oxygen
- 💧 Chlorophyll
- 💧 pH

**Bacteria, invasives**



**Credibility doesn't mean  
having the most exacting  
techniques. It means  
delivering on your  
promises,  
no matter how  
small or large  
they are.**

**-Meg Kerr  
RI River Rescue**

# Scientific Rewards

- 🔹 Huge increase in number of locations monitored (~10 vol mon to 1 agency site)
- 🔹 Weekly rather than annual (or less) monitoring
- 🔹 Source of long-term data (15, 20, 25 years...)
- 🔹 Identifying the high quality waters as well as problem areas
- 🔹 Finding causes of problems

# Volunteer Monitors Are Citizen Scientists



# Agency/Research Questions (hypothesis-based / probabilistic)

- What is the **condition** of the nation's surface, ground, estuarine, and coastal waters?
- Where, how and why are water quality conditions changing **over time**?
- **Where** are problems related to water quality and **what is their cause**?
- Are **programs** to address problems **working effectively**?
- Are water quality **goals and standards** being **met**?

# Community and Individual Concerns (targetted monitoring)

- I want to find out what's in my water.
- I think there's something wrong with my lake.
- How do I get rid of these weeds?
- Why does the stream go dry now?
- Will my grandkids be able swim here?



“It is in the marriage of credible data and increased stewardship behavior that the true potential and vitality of citizen monitoring begins to emerge.”

-Steven Hubbell, Colorado River Watch

# Volunteer Monitors are Community Educators



# Educational Rewards Youth to Seniors

- 💧 De-mystifying science
  - 💧 Its not just for professionals!
- 💧 Increasing science literacy
  - 💧 Learning the language
  - 💧 Appreciating the process
- 💧 Hands-on activities
  - 💧 Doing enhances learning!
  - 💧 learning from mistakes
- 💧 Being outside



# Rewards for Families



- ◆ Strengthening family relationships
  - ◆ Working together for a good cause
  - ◆ Doing together instead of watching from the sidelines
  - ◆ Kids teaching parents
  - ◆ Parents teaching kids
- ◆ Tangibly connecting people to what surrounds them
  - ◆ counteracting the artificiality of TV, videos, computer games
- ◆ “I remember when...”

# Societal Rewards

- Volunteer monitoring originates in the community & builds strong community partnerships
- Volunteer monitoring educates the community to make informed decisions
- Volunteer monitoring provides youth with civic lessons and hands-on science
- Volunteer monitoring provides a pathway to increased civic activities/responsibility
- Volunteer monitoring can reach underserved audiences

# Volunteer Monitoring & Local Participation in Natural Resource Issues (WI)\*

- 💧 Experienced monitors –
  - 💧 Did not have more factual info about water quality
  - 💧 Feel more connected to those in their community concerned with environmental issues
  - 💧 are more likely to participate in political action events
    - Reading on issues, doing personal research (72%)
    - Talking with neighbors (72%)
    - Attending public meetings (65%)
    - Sharing monitoring info with others (54%)

\*Overdevest, Orr, Stepenuck, Human Ecology Review 2004. vol 11 #2 p.177-185

# Casco BayKeepers, Maine



Testing oxygen levels near Portland harbor, Joe Payne doesn't breathe the easy knowing lawn care products can migrate into Casco Bay

## Why weed 'n feed isn't fish food

The Casco BayKeeper explains:

"As home to the East Coast's third busiest oil port, Casco Bay faces serious risks that are easy to see.

"One that's especially threatening, however, is unseen. And it comes from our own backyards," says Joe Payne, BayKeeper and Executive Director for Friends of Casco Bay, the watchdog organization committed to protecting and improving Casco Bay.

"Some 270,000 people—a quarter of all Maine citizens—live within the Bay's watershed. The lawn and garden products we use, discard or spill, from as far away as Maine's western mountains, end up right here in the Bay."

"Weed and feed chemicals are a big concern. Containing both fertilizers and up to eight types of weed killers, these products are certainly convenient. And popular. According to state regulators, Maine do-it-yourselfers buy about 750,000 pounds of weed and feed products annually."

"Unfortunately, these chemicals pose all sorts of problems once rain water runoff carries them into streams, rivers and eventually Casco Bay.

"There, the fertilizers promote rapid growth of algae which decays, robbing the water of oxygen. Meanwhile, the herbicides can impact fish and shellfish. This double-barreled blow results

in degraded water quality and environmentally challenged marine life. Who knows what effect that will eventually have on our seafood?"

### Ending a hazardous trickle-down effect

"Too often folks use weed and feed products along with other pesticides because of habit, rather than necessity. Less harmful alternatives do exist, some as simple as watering and mowing your lawn properly or pulling weeds by hand.

"If you must treat your lawn, apply only on trouble spots, not the entire yard. Avoid use where grass is sparse, on steep slopes, in ditches or right next to water. And keep pesticide sprays from drifting into open water.

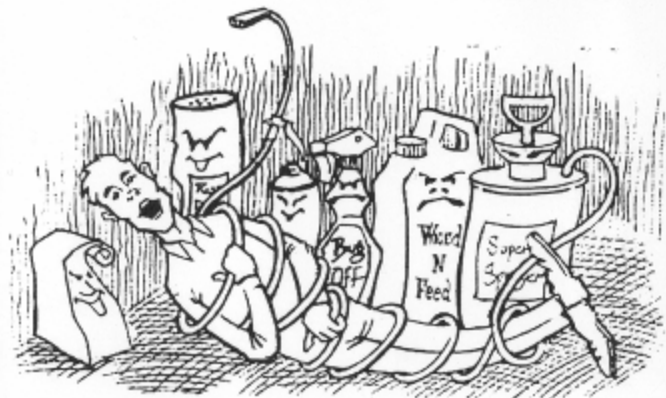
"Also, prevent disposal problems by purchasing only as much pesticide as you need for a given job and by giving away excess usable chemicals to someone else who will apply them properly.

"Advice on responsible lawn care is as close as your telephone. These agencies have helpful folks who want to help you keep weed and feed products in their place...and out of Casco Bay."

Maine Board of Pesticides Control...287-2731

University of Maine Pest Management Office...1-800-287-0279

**Think first...Spray last!**



## Too Wound Up in Lawn Care Chemicals? There's an escape....

Finally, an evening workshop to learn how to care for lawns and plants with less of the chemicals that harm our waterways. Meet area stewardship groups and lawn & garden pros too.

**And it's free!**

Discover how a beautiful landscape can protect our precious lakes, streams and coast at this important program entitled:

**"From Bethel to the Beach, Protecting Casco Bay Begins in Your Backyard"**

■Where: L.L. Bean's Casco Conference Center, 7/10th mile south of L.L. Bean's 24-hr store, Lower Main St., Freeport. ■When: Wednesday, March 22, 2000. ■What's in store: 5:30 p.m. open house, presentations from lawn and ornamental plant specialists at 7 p.m. ■That's not all: Meet "The humble Farmer," Downeast humorist and Maine Public Radio host.

for more information  
call 799-8574

Brought  
to you by



# Participatory Research

- Communicate, Coordinate, Collaborate
- Build Consensus
- Empower Communities
- Recognize your Capacity
- Enjoy your results!

# Lake Chocorua Project: NH Lakes Lay Monitoring Program

- Volunteers documented a water quality decline traced primarily to highway runoff.
- Multi-agency taskforce, including Extension, the Natural Resource Conservation Service (NRCS), and state agencies, collaborated to design and implement a series of Best Management Practices to mitigate the road runoff.
- NHLLMP Post implementation monitoring showed an 84 to 92 percent reduction in phosphorus loads to the lake from highway sources.



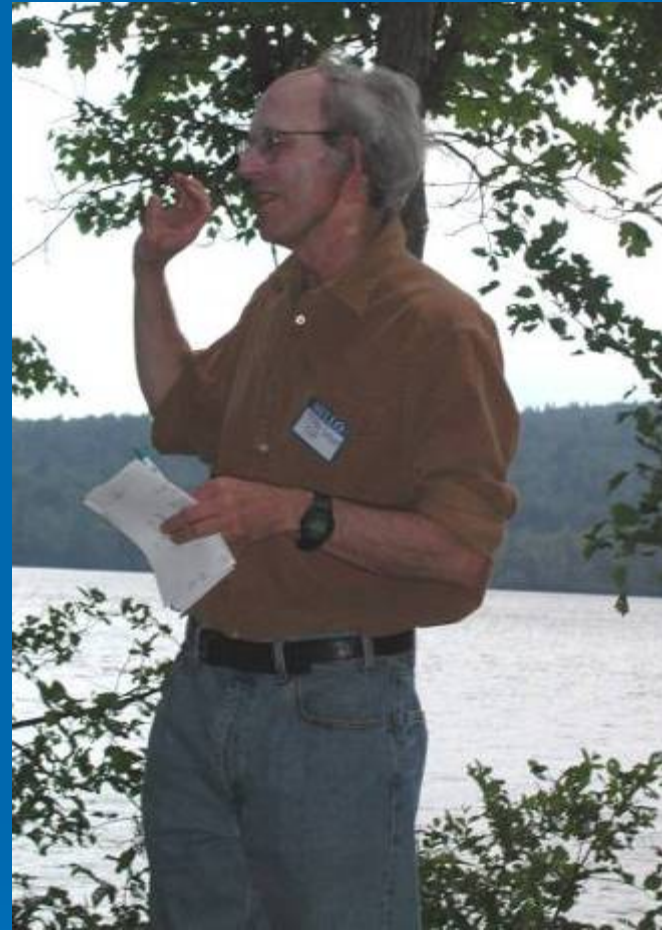
(the volunteer monitors were)  
'the "hub of the wheel" that  
made the project a  
success...They provided  
the factual data on which  
decisions were made.' - -  
*Sherry Godlewski*  
*NH DES*

'...it is this type of model  
project that we at the EPA want  
to support and continue to see  
occur ... '

-Warren Howard EPA-NE



‘I don’t know  
when was the last  
time I’ve worked  
with 12 agencies  
and gotten  
something done’



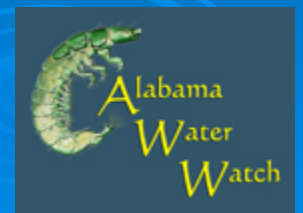
*-Toby Page*

*Lake Chocorua Association*



UNIVERSITY of NEW HAMPSHIRE  
COOPERATIVE EXTENSION

Program goals, activities and cycles have a powerful influence on who participates, how long they stay active, and data credibility

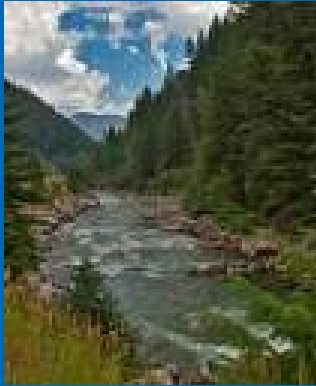


- 💧 Research questions can usually be answered at any point
- 💧 A year lost monitoring is a year lost forever
- 💧 Monitoring data
  - 💧 Permanent contribution
  - 💧 Used over and over
  - 💧 Grows in value with age

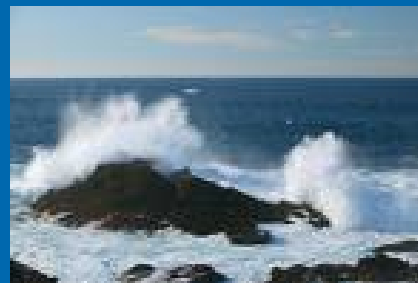
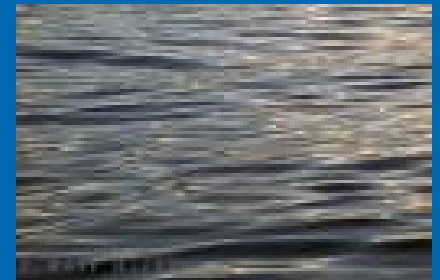
Sam Droege  
USGS Patuxent Wildlife Research Center  
Citizen Science Toolkit conference June 2007

# Volunteer Water Quality Monitoring Programs...

- ◆ Educate the public on water quality or watershed issues, and how to protect and restore resources,
- ◆ Encourage citizens to adopt “watershed-friendly” behaviors and policies,
- ◆ Brings university science to the community and the community to the university,
- ◆ Gain valuable water quality data that is distributed to community decision makers in a usable format,
- ◆ Enable communities to take action to protect and restore their waters



What ripple effects are you causing?





**Thanks!**

**Linda Green**  
**lgreen@uri.edu**  
**401-874-2905**