



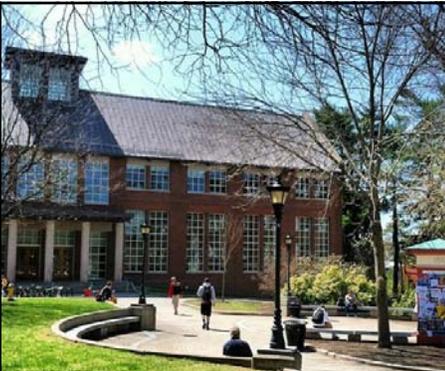
**NH Citizen Lake Monitoring Survey**

Bringing Science into Lake Communities

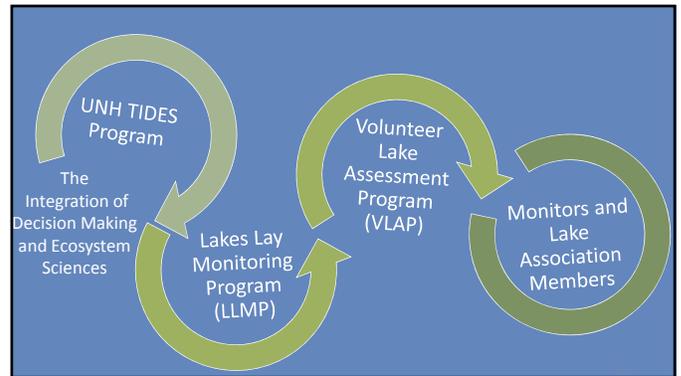
UNH  
Helen Perivier  
Volunteer Lake Assessment Program  
Workshop, NHDES Concord, NH

**The People Involved**

- Helen Perivier      Principle Researcher
- Jeff Schloss      UNH Cooperative Extension
- Sara Steiner      Volunteer Lake Assessment Program Coordinator, NHDES
- Bob Craycraft      Lakes Lay Monitoring Program Coordinator
- Mimi Becker      Dept of Natural Resources, UNH



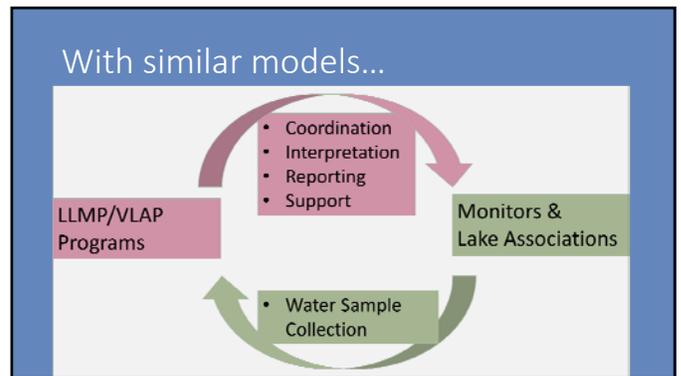
**The Beginning of the project**



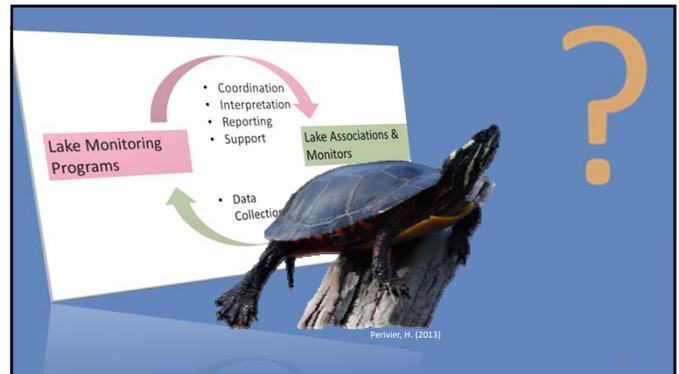
**NH Lake Monitoring Programs**

<p><b>Lakes Lay Monitoring Program (LLMP)</b></p> <ul style="list-style-type: none"> <li>• 1979</li> <li>• UNH Cooperative Extension and the UNH Center for Freshwater Biology</li> </ul>	<p><b>Volunteer Lake Assessment Program (VLAP)</b></p> <ul style="list-style-type: none"> <li>• 1985</li> <li>• NH Department of Environmental Services</li> </ul>
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700+ volunteers monitoring on 170+ lakes

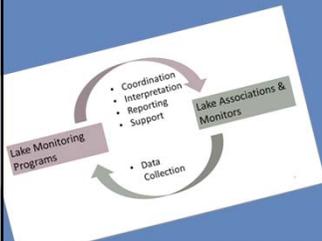


...to achieve the same goals



## Key Question

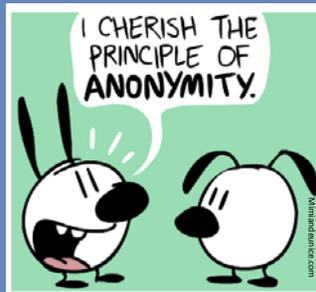
Does lake monitoring science reach and inform decisions in lake communities?



## Survey Methods and Design

## Ethical guidelines

- Informed consent
- anonymity
- approval by UNH Institutional Review Board



## Survey focus areas

- Respondents
- Local Government
- Broader Community
- Collaborations
- Program Feedback

### In respondent's own words

- Open ended and non-guided questions (30)
- Multiple choice (26)
- Mixed - multiple choice with text option (7)
- Self-validating through repetition

### Qualitative and Quantitative Analysis



Screenshot of analysis of open-ended question:  
*Have decision makers actively requested lake monitoring data and information?*

### Recruitment & Distribution

Qualtrics online survey software

coordinators email survey link to about 300 monitors and volunteers

Collect responses  
May - July 2013

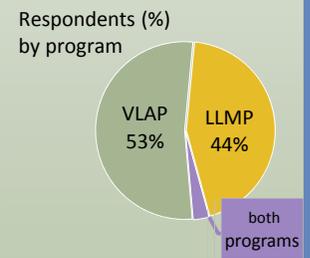
### Results

### The Respondents



### Great Participation!

- Approximately 300 contacted and 123 responded
- 40% response rate!
- Good distribution between programs
- 90 lakes represented



### Strong Commitment and Program Retention

More than one-quarter of the respondents had monitored with the programs for 15 years or more



### Respondents

- Half participate with community committees
- 15% in government positions, mostly local
- One-third lake or watershed association officers
- One-quarter with background as educators
- 44% retired

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### Over half monitored with additional programs

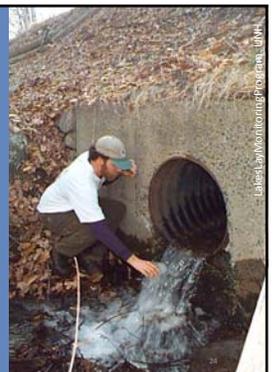
Most consistently with **invasive weed monitoring** on lakes, as well as ...

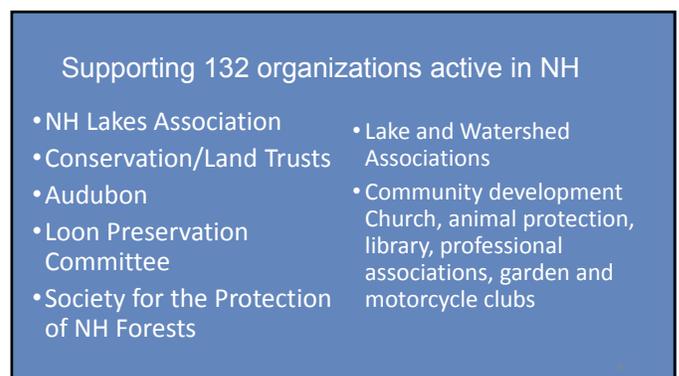
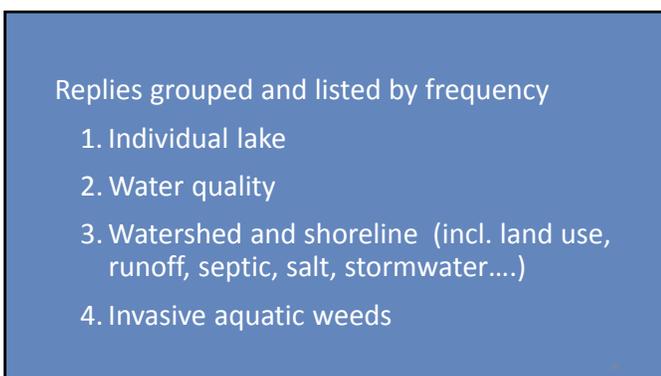
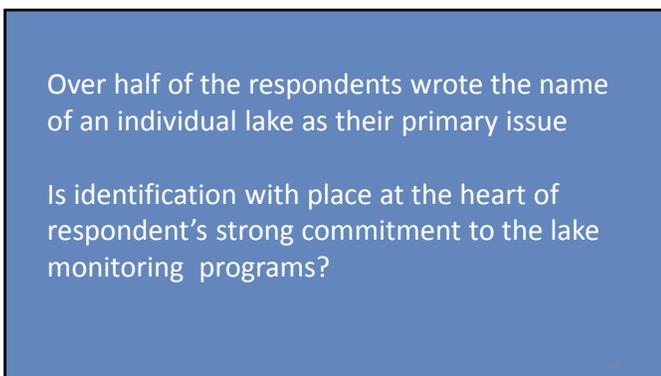
- Rivers
- Watersheds
- phytoplankton
- Loon
- Boating
- birds

ation Control Conway Coordinator Council Counts Custodian Dipin Director Easement Elim  
 g Host Invasive Lake Lay Loon Lovotcs Lrct Maine Merrimack Millbol Mo  
 Offered Patrol Person Plant Point Position Preservation Previous Pgrams Program Protec  
 pling Secchi Serves Site Society Spouse State Sunapee Town Tributary Upper Vacant V  
**Watching** Water Watershed **Weed**

... with benefits extending past the community level

- Invasive weeds spread
- Rivers and watersheds cross borders
- Wildlife wanders





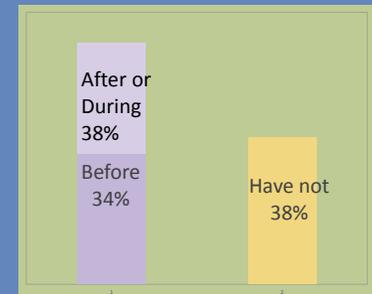
Over half became more involved with lake and conservation issues after becoming a monitor



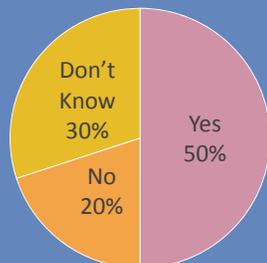
Local  
Government

Half of the respondents had personally presented lake data to their town officials

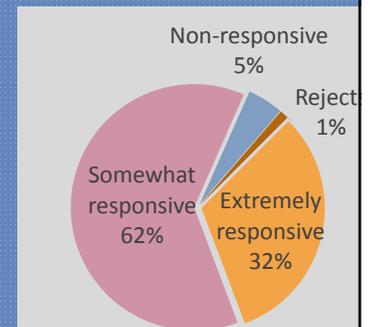
Did you start engaging with local government *before, during, or after* monitoring?

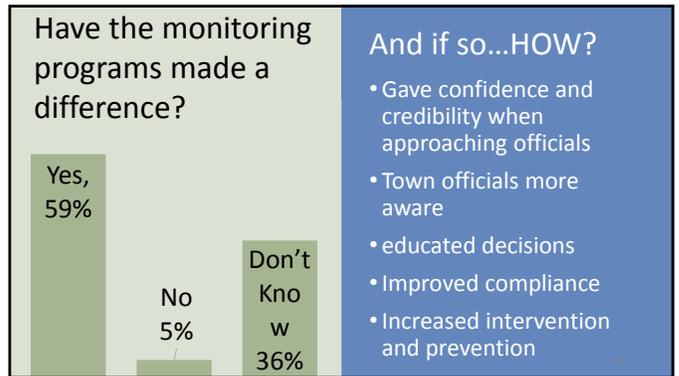
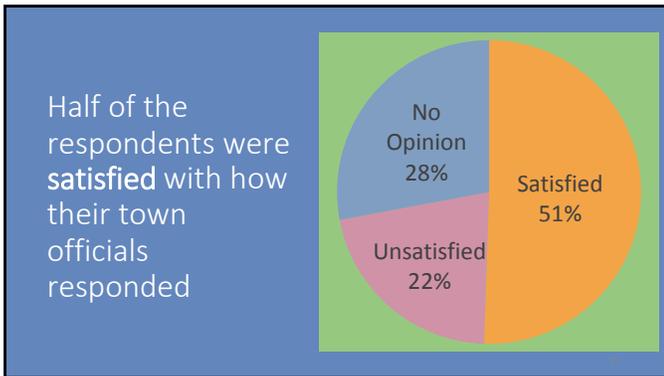


Did town officials actively request input from monitors and their lake associations?



Most respondents found their town officials **somewhat receptive or responsive** to lake information





- Town officials used information when facing decisions
- town ordinances
  - zoning
  - funding projects
  - invasive weed controls
  - restoration & interventions
  - monitoring costs
  - watershed master plans
  - easements
  - voting

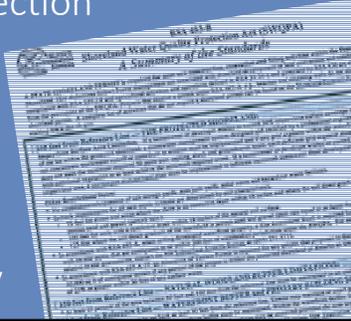


- Relationships to improve responsiveness
- Building relationships with town officials
  - Inviting town officials to lake association meetings and participate in monitoring
  - Finding training opportunities
  - Being aware of the timing of town meetings and decision process

- Roles Matter
- Conservation Commissioners most friendly to lake information
  - Planning Board most frequently requested input
  - Selectmen viewed most ambivalently

## Shoreland Protection

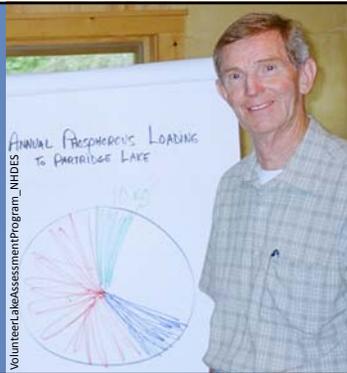
- the only policy mentioned in the survey
- Problems with reporting and enforcing in a small community
- Developers ignore and pay fine
- Officials look the other way



## Community



58% of the respondents had presented lake information or mentored others in their community on lake friendly living



Lake association meetings stood out as the most consistent way of sharing monitoring and stewardship information



## Word of Mouth

- Friends and neighbors
- Door-to-door education campaign
- Neighborhood covenant for lake-friendly property practices



Shoreline residents received special mention

- Noted as a unique group
- Particular interest in the lake
- potential for both positive and negative impacts
- Some said that education of shoreline residents should be a priority.

Lake Information Was Distributed In Diverse Ways and Varied with Community

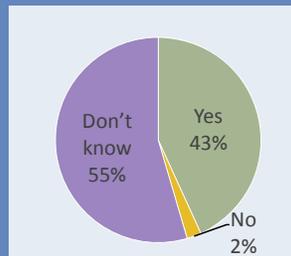


- Town hall
- Websites
- Libraries
- Schools
- Clubs
- Events
- Newsletters
- Newspapers
- Churches



Have lake data and reports influenced community and active participation to protect water quality and your lake?

It is hard to track people's behavior!



What motivates the community?

- Property values
- Quality of life - health, clean water, aesthetics, recreation
- Community pride
- Future generations
- Education

Seeing positive results and active stewardship also motivated the community



Importance of Lake reports in the community

- They maintain community interest
- Provide a tool to educate others
- Motivate support and participation in lake protection
- Create a ripple effect

### Community Use of Lake Information

- Guidance for stewardship of lake and lakeside property
- Look for algal blooms
- Find where the fish might be hiding
- Realtors and property owners to promote sales

### Engaging Schools

A quarter of the respondents either had engaged schools or said schools had used lake monitoring information



### Engaging Schools

- Elementary to college age
- Integrated in Curriculum
- Projects
- Field trips
- Trainings in monitoring and stewardship
- Support volunteer efforts (e.g. Lake Hosting)



### Collaborations



A third said they or their associations collaborated with peers across lakes, sharing resources, ideas and experiences



### Motivators

- Watersheds
- Invasive weeds
- Interconnected water bodies
- A shared lake



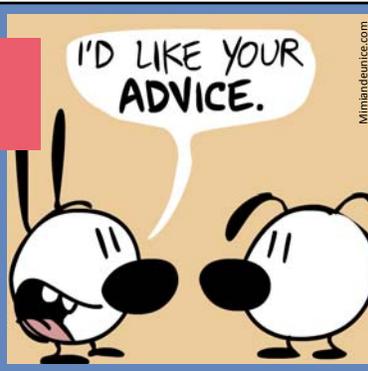
## Collaborations – Activities

- Joint Lake Host trainings
- Field trips, demonstrations
- Joint grants
- Sharing data, equipment and educational materials
- Joining each other's activities and meetings
- National Secchi dip-in

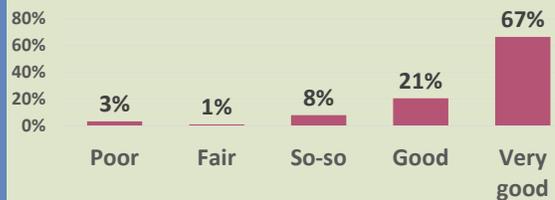
## Collaborations

- Watershed survey, ordinance, protection plan and restoration projects
- State river nomination program
- Donated land to a local land trust
- NH Lake Association and Maine Lake Congress provide platforms for people to collaborate

## Program Feedback



## How well does your program communicate lake information to you?



## Respondents overwhelmingly preferred email



## Feedback: Lake Reports

- Favorable comments
- Post online for access and further distribution
- Evenly split in preferences of more vs. less technical language
- Hard copies of big documents appreciated
- Report data in real time
- Trend analyses, cross lake comparisons

## Feedback: Monitoring

- More parameters
- Remote sensing
- More funding, equipment, people
- Annual state biologist lake visits
- Monitoring for changes in community behavior

- nitrogen
- leaking septic systems
- erosion and sediment
- cyanobacteria indicators
- new invasive species
- toxics (metals, MBTE, pharmaceuticals, mercury, chlorides)

## One-fifth interested in more trainings

- advocacy
- grant writing
- presentations
- monitoring methods
- stewardship techniques
- pond life



## Concluding Remarks

## Increasing community capacity



## Evidence that Programs Increase Community Capacity

- Stable and committed base
- Demonstrated contribution to decision making
- Indications found that programs may encourage steps towards civic engagement
- Benefits extend to neighboring towns and state

## Building Bridges with Decision Makers

- Respondents found that engaging officials in activities, meetings and dialogue increased responsiveness to lake information
- Conservation Commissioners emerged as potential ambassadors with local government
- Officials most receptive to lake information at decision making moments

## Opportunities...

- Collaborating with peers from other lakes
- Engaging schools

## ....and Challenges

- How do you measure changes in behavior within the community?

Ideas  
Thoughts  
Questions

