

# Seven Habits of Highly Effective Science Translators

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# Why science translation?

## Environmental Literacy IN AMERICA



*Environmental Literacy in America:  
What 10 Years of NEETF/Roper Research and Related Studies Say About Environmental Literacy in the U.S*

“Our citizenry is both largely uninformed and misinformed”

# Good science translation is good 'marketing'

- The public wants policy based on unbiased factors
- Informed policy makers can defend their decisions with good data
- Well-presented science is persuasive

# Who's your audience?

- Probably adult
- Volunteers
- Local, state officials
- Unknown motivation
- Definitely not captive

# Adult learners want structure

- Tell them what you're going to teach them
- Teach them
- Tell them what they've learned

# Seven Habits of Highly Effective Science Translators

1. Target 4<sup>th</sup> Grade Reading
2. Less is More
3. Simplification is not Sensationalism
4. 1 Picture is worth 1000 words
5. Inform, don't Advocate
6. Think Impact
7. Practice Good Writing

# Translation Habit #1: Target 4<sup>th</sup> Grade Reading

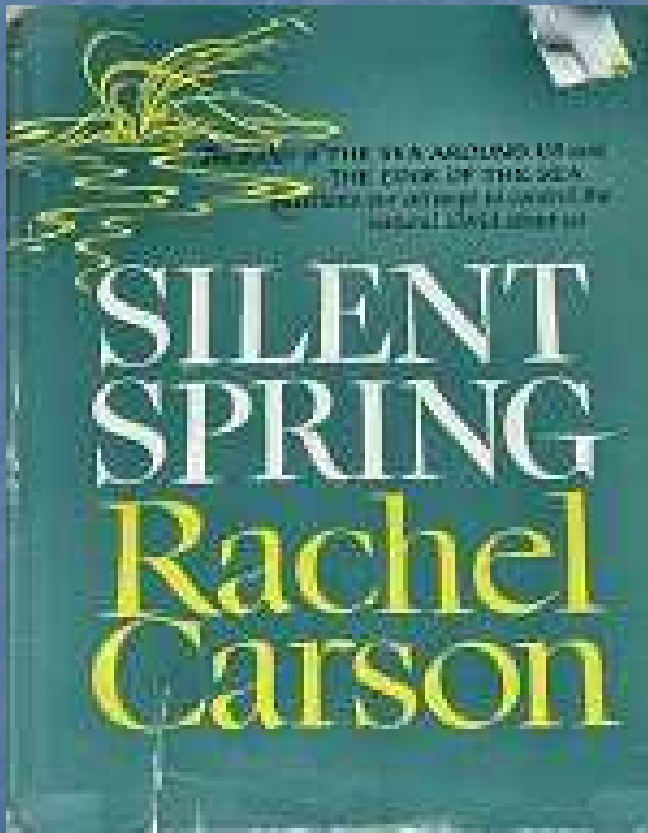
- You're speaking a different language
- Don't make them work too hard to follow
- Answer the question "So what?"

# Seven Habits of Highly Effective Science Translators

**Our original title:**

“Developing policy-relevant research messages based on scientific data that can be made relevant to the general population: how to reduce complex issues to simpler pedagogical concepts in order to be more effective, persuasive, and meaningful.”

# The Classic That Launched the Environmental Movement



## Translation Habit #2: Less is more

- Deliver information in small chunks
- Learn to explain your issue in few words
- Impart a single take-home message, i.e.  
**“Leave no trace”**  
**“Every acre counts”**

***My buffer strip  
protects  
your water quality!***

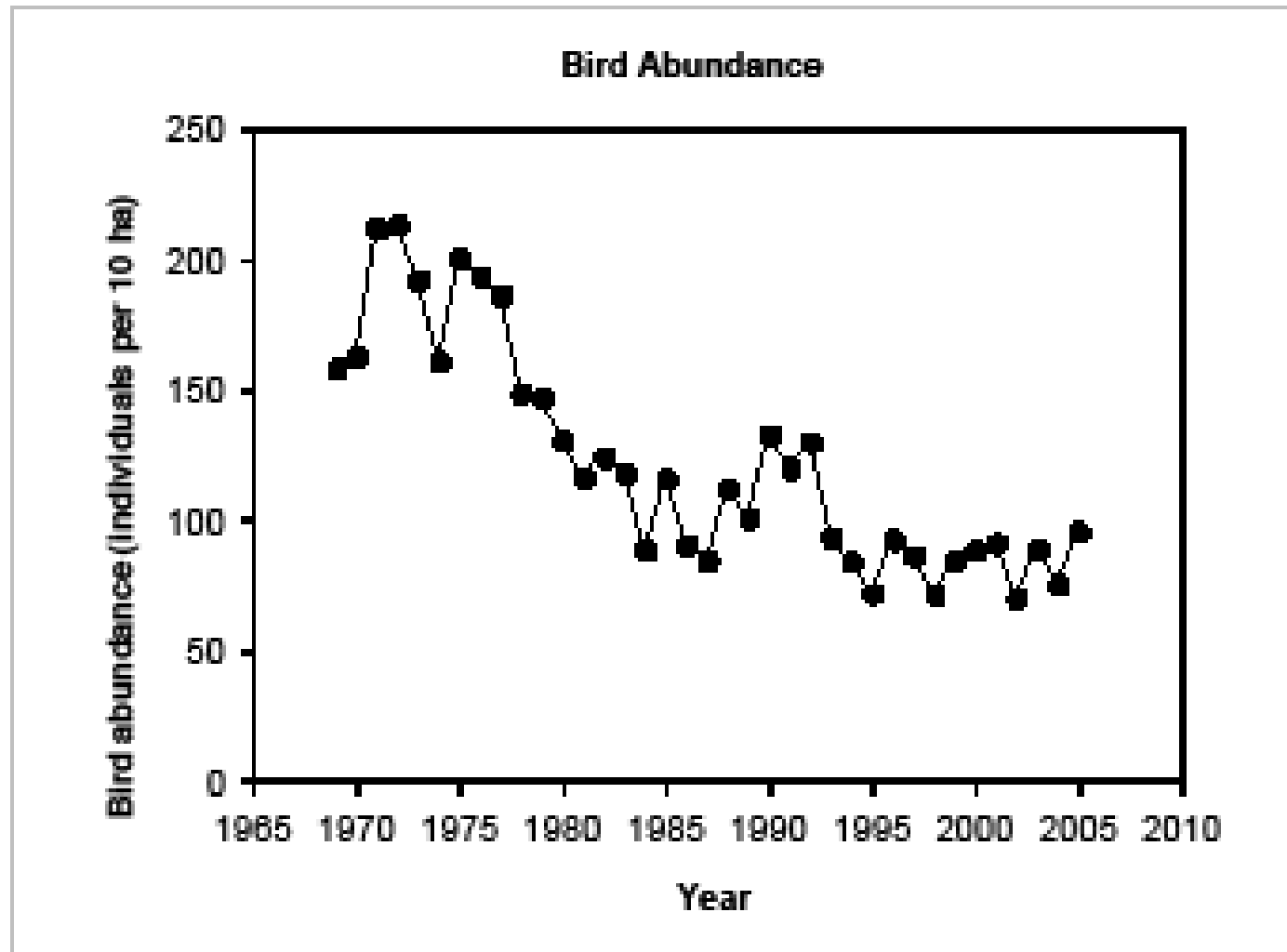


**A local volunteer program  
to give away native trees for  
improving buffer strips around lakes**

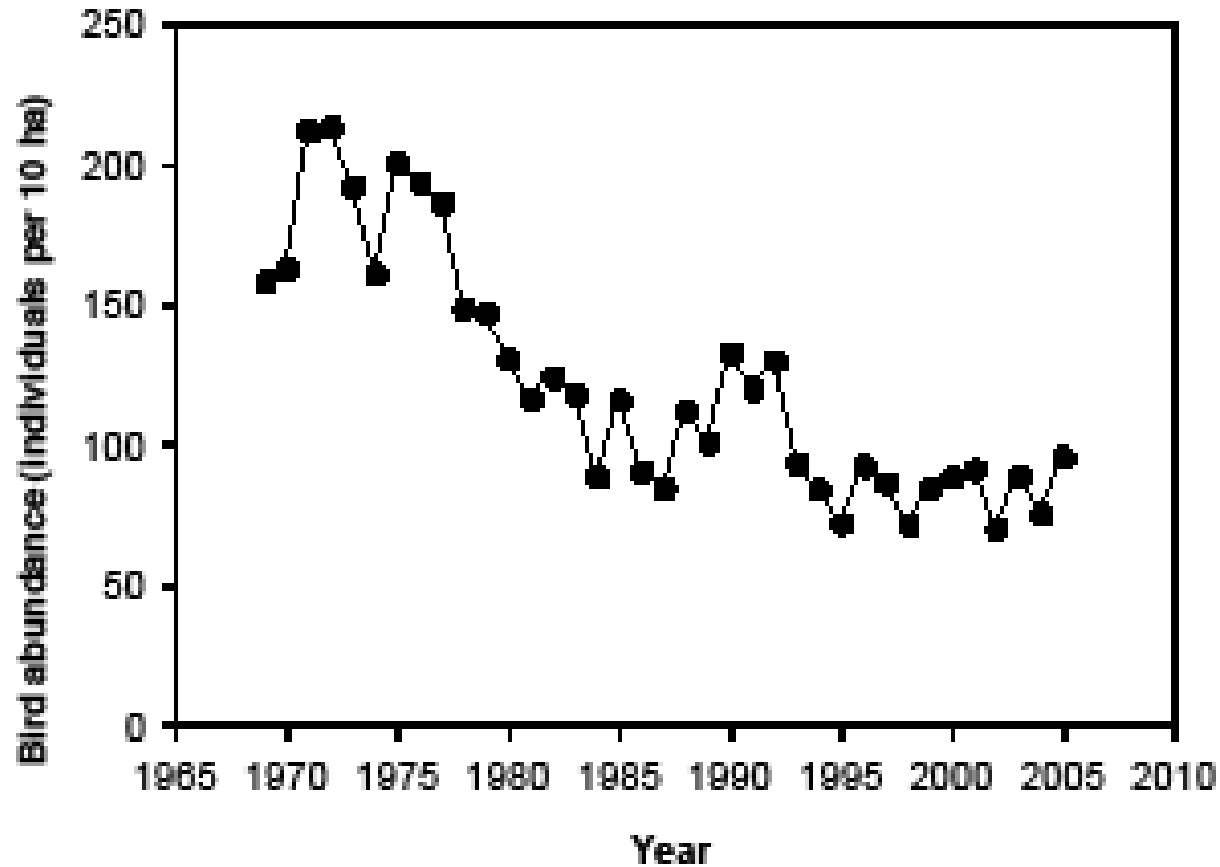
# Translation Habit #3: Simplify, don't sensationalize

- Simplify for clarity, not for effect
- Suggest possible conclusions from data

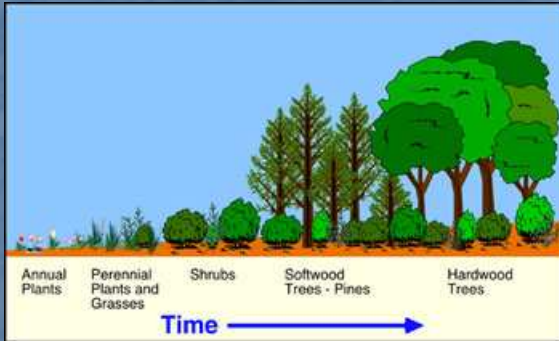
# What are the scientists at Hubbard Brook learning?



## Declining bird abundance at HBEF



# Possible reasons for declining numbers of birds at HBEF:



The forest is changing, as it grows older (succession)?



Forest fragmentation?



The migratory path is hazardous?



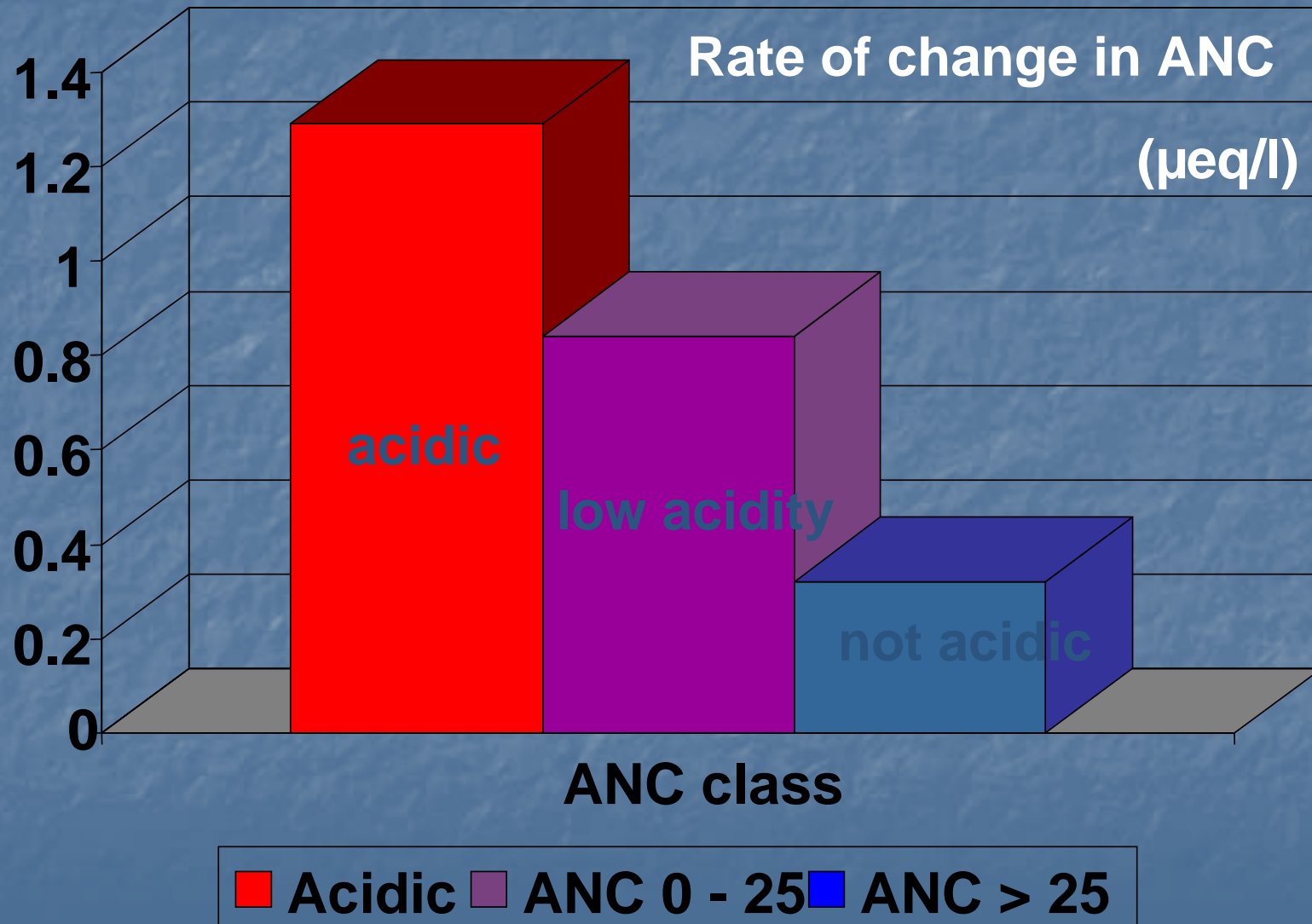
Food sources are declining?



Loss of either breeding or non-breeding habitat?

# Recovery in northeastern acidic lakes, 1990-2000

## ANC CLASS





SAVE LAKE  
WAUKEWAN

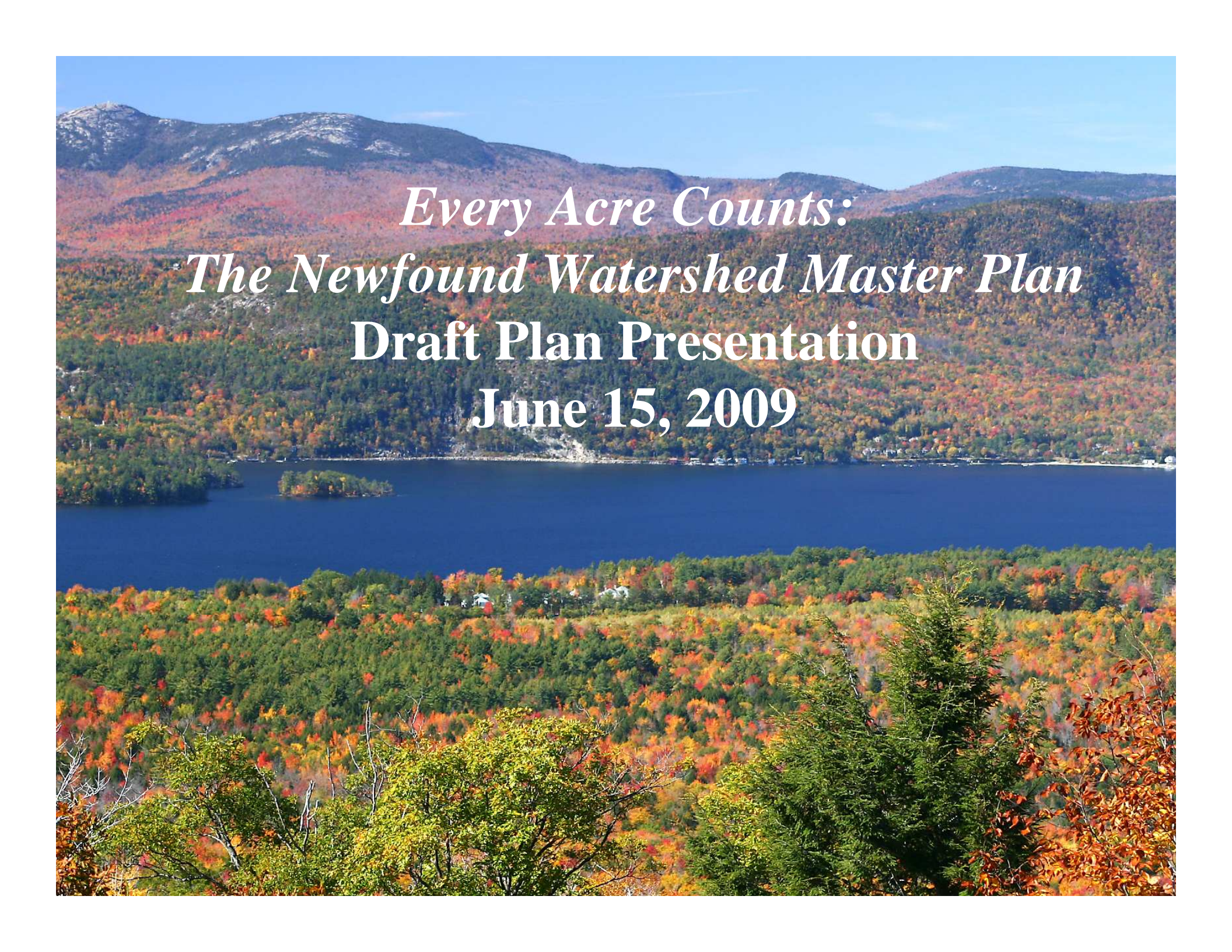
**Vegetate**  
(shorelines)

*and*

**Infiltrate**  
(runoff)

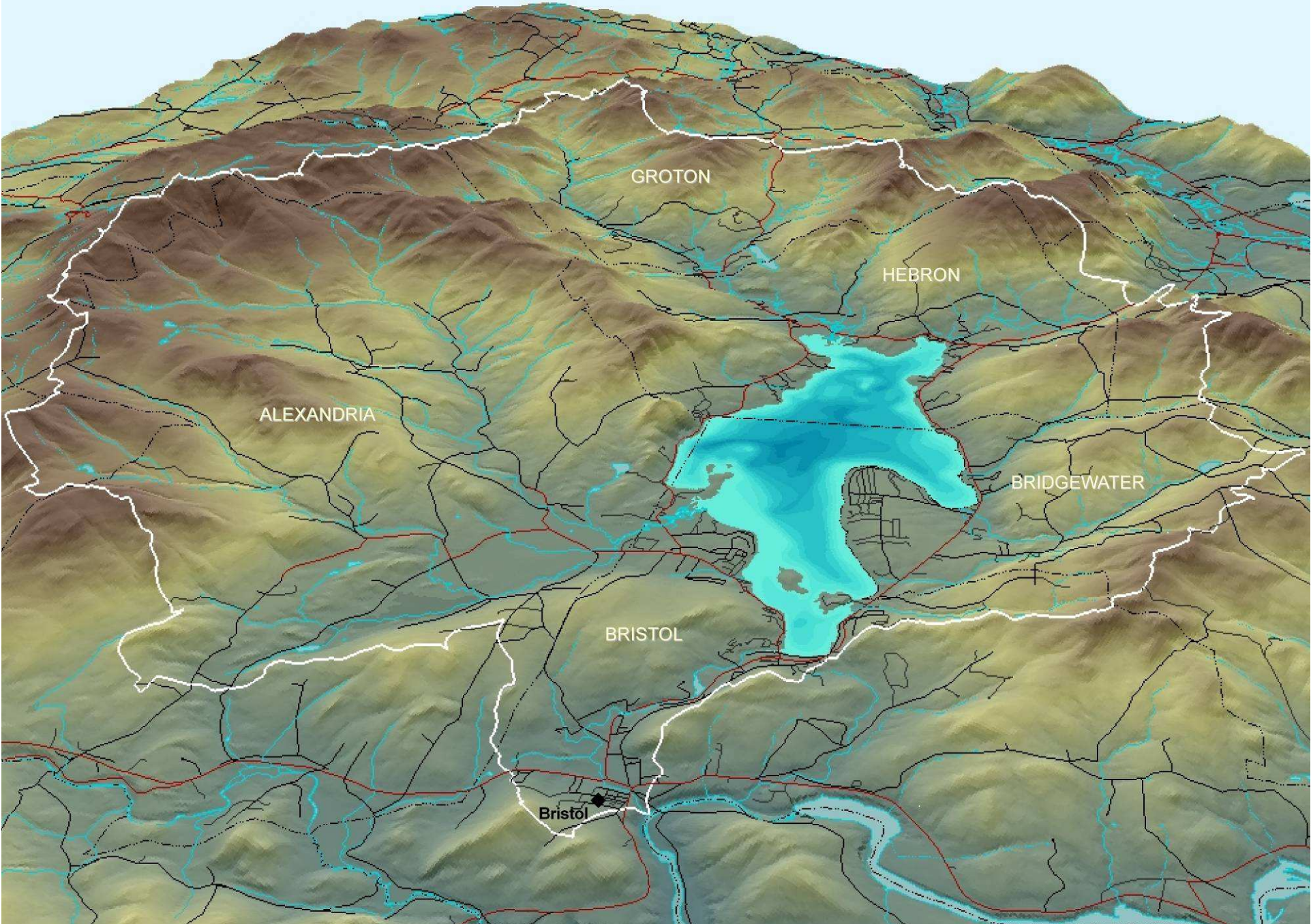
# Translation Habit #4: 1 Picture is worth 1000 words

- Maps and pictures help viewers visualize the issue
- Graphics tell the story in less time & space
- Visual aids increase learning success
- Entertainment, aesthetic value



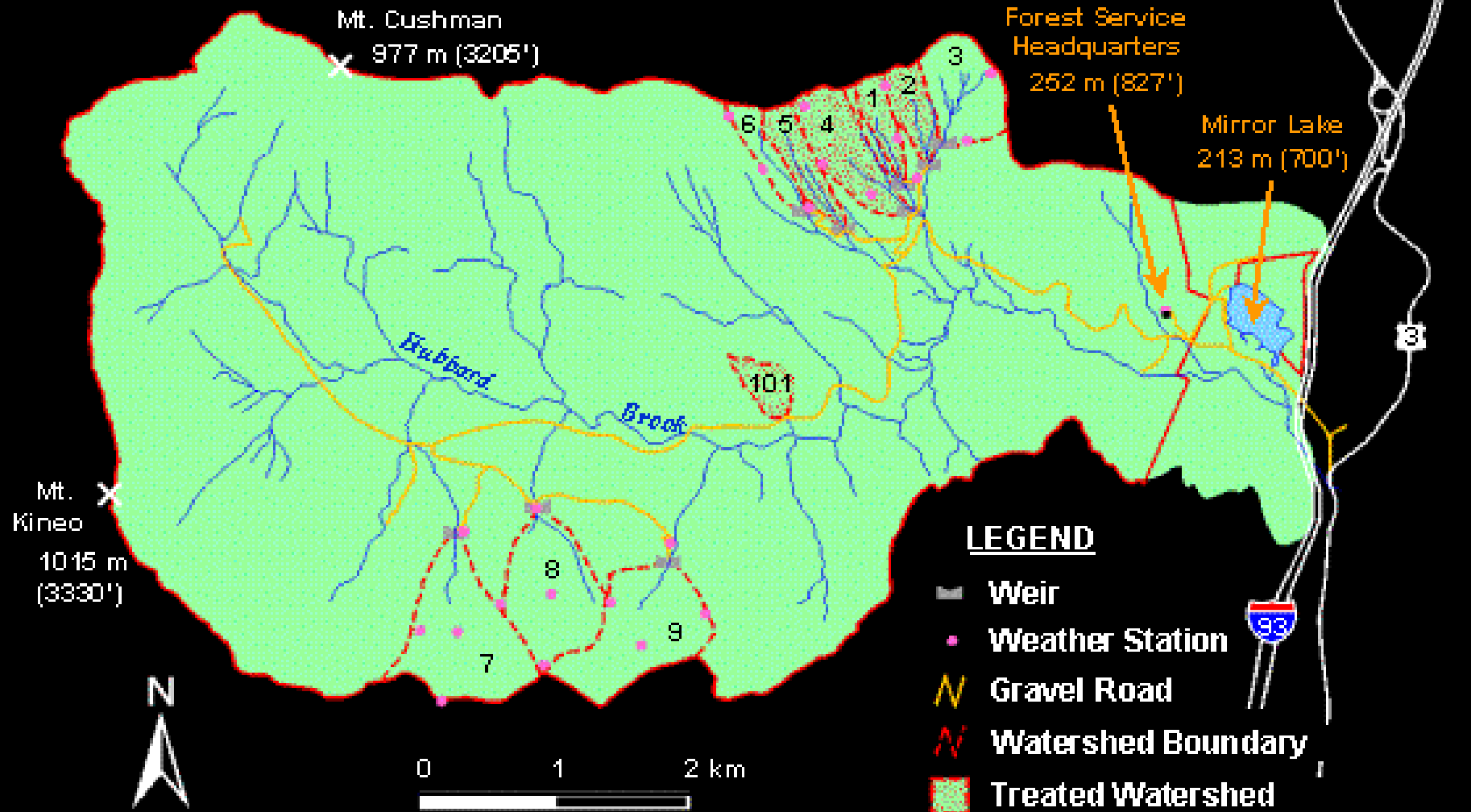
*Every Acre Counts:*  
*The Newfound Watershed Master Plan*  
**Draft Plan Presentation**  
**June 15, 2009**

# NEWFOUND LAKE WATERSHED



# Hubbard Brook Experimental Forest

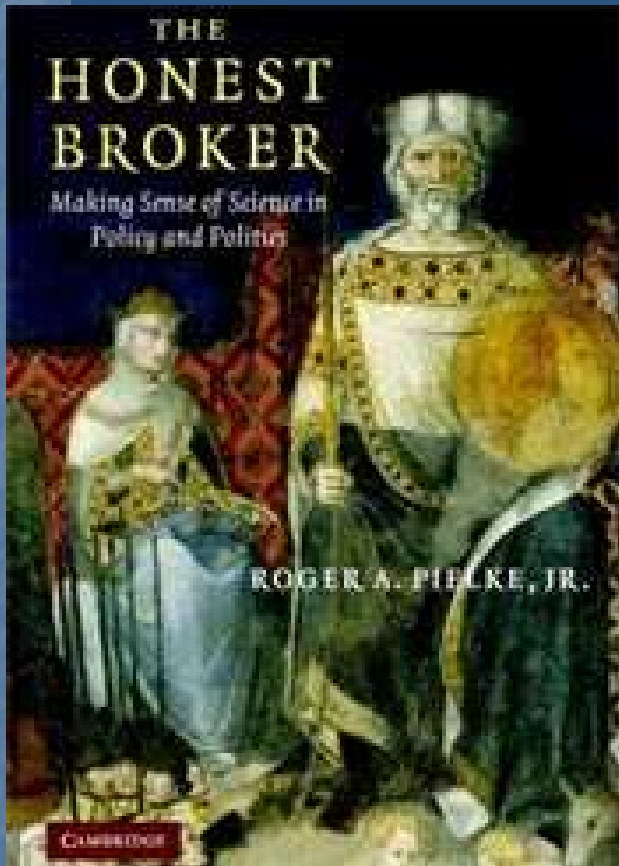
West Thornton, New Hampshire



## Translation Habit #5: Inform, Don't Advocate

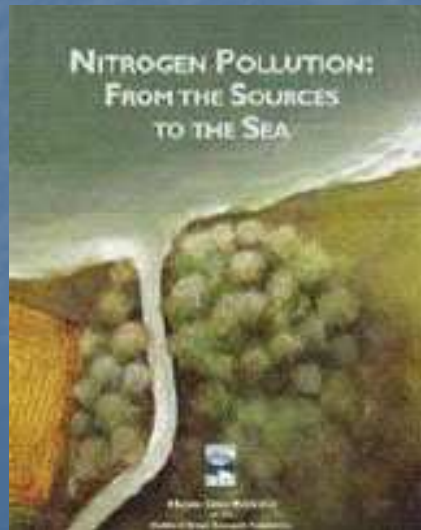
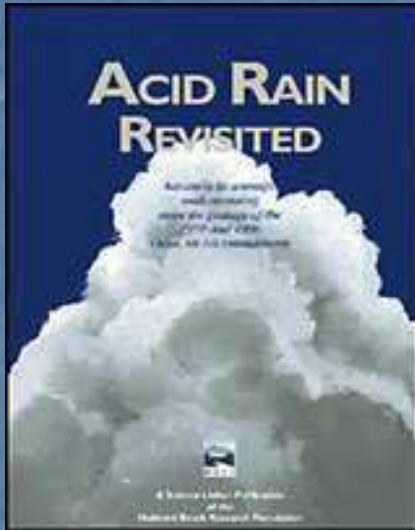
- Science loses credibility when bias creeps in
- The goal of science is to seek understanding
- Good scientists share their knowledge

# Four Policy Roles for Scientists

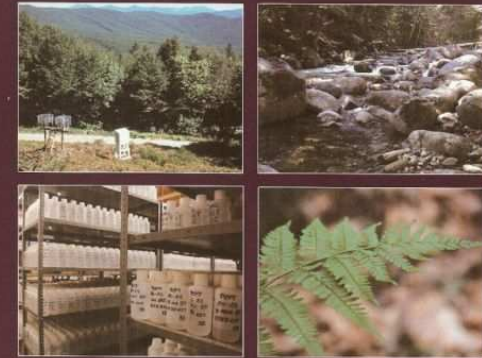


- Pure scientist puts information in journals
- Science arbiter serves as a [passive] resource to answer factual question
- Honest broker of policy-relevant science: offers [proactive] alternatives and choices based on unbiased view.
- Issue advocate lobbies for a particular choice

# HBRF Science Links



## Long-term Trends from Ecosystem Research at the Hubbard Brook Experimental Forest



John L. Campbell  
 Charles T. Driscoll  
 Christopher Eagar  
 Gene E. Likens  
 Thomas G. Siccama  
 Chris E. Johnson  
 Timothy J. Fahey  
 Steven P. Hamburg  
 Richard T. Holmes  
 Amey S. Bailey  
 Donald C. Buso

# Why HBRF does Science Translation

**“When *public money* has been used to *fund our research* over the last 30 years, there is a *social contract* to get the science out there in a useful way. We think it's our *obligation to infuse public policy debates with strong science.*”**

**(Cathy Lambert, Former Executive Director of HBRF)**

# Translation Habit #6: Think impact

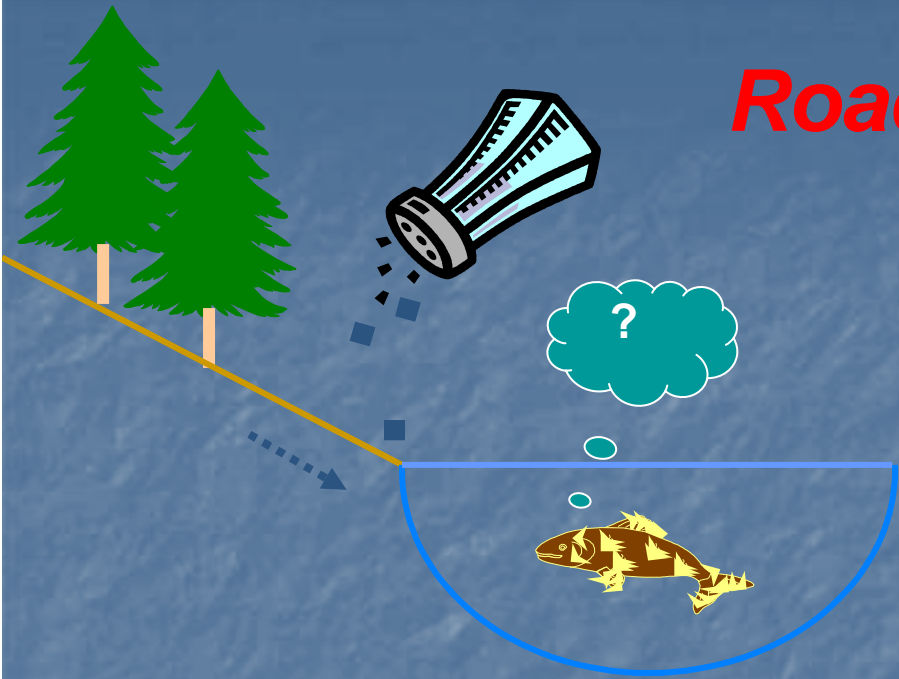
- Single take home message or goal
- Why, who, when, where will someone care?
- If policy or action, “think globally, act locally”

## Recent NH floods

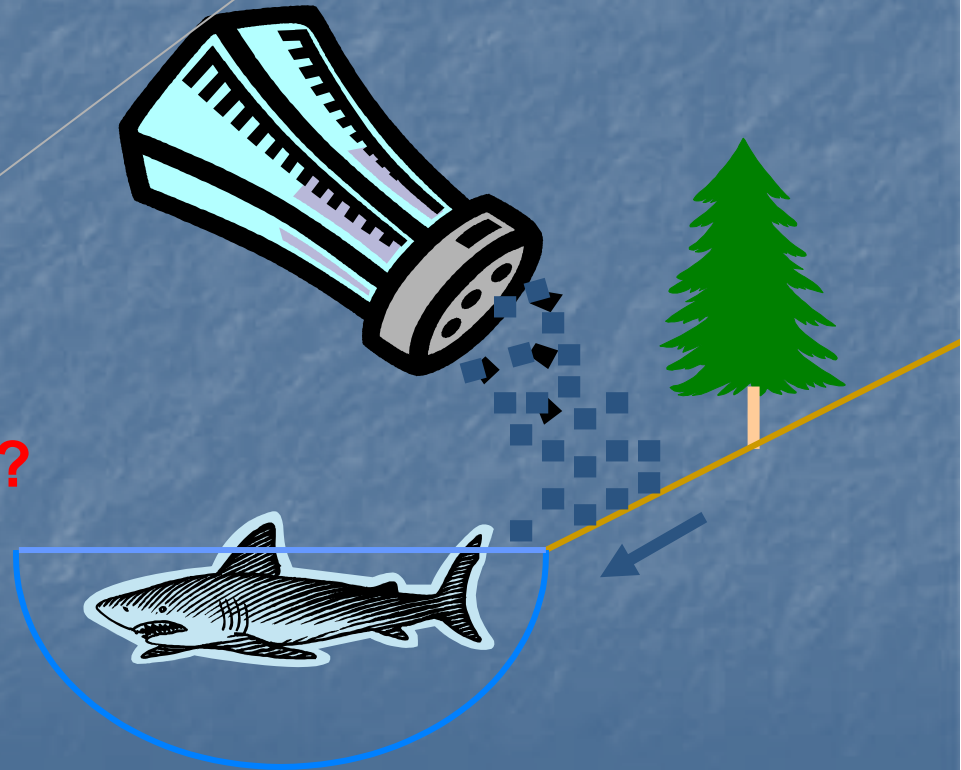
Upstream imperviousness increases stormwater runoff and increases flooding



# Road salt: why do we care?

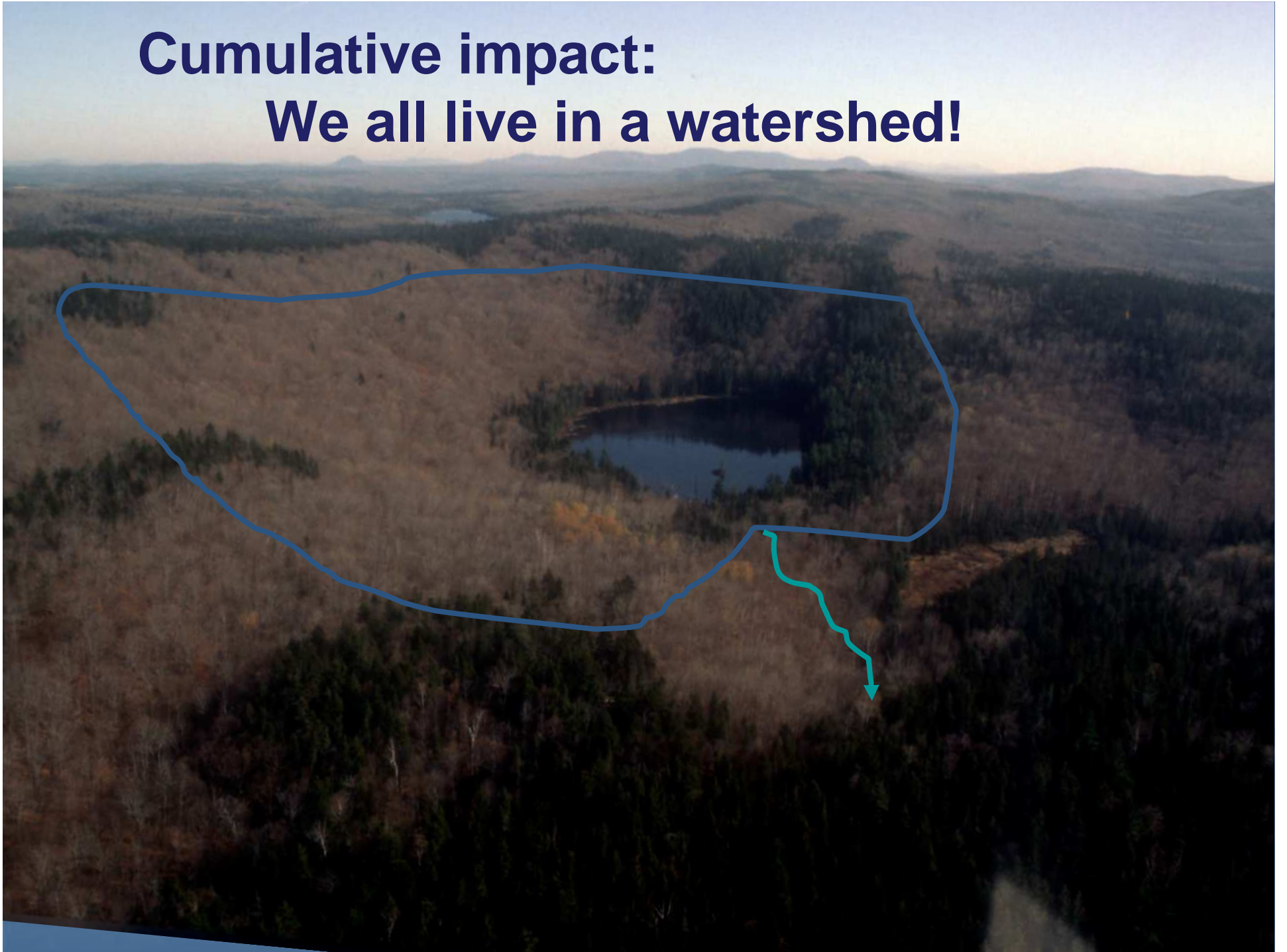


...this?



...or this?

**Cumulative impact:  
We all live in a watershed!**



# Science Translation Habit # 7

## Practice Good Writing

- Forget about academic style
- Use plain language, no jargon
- Keep sentences and paragraphs short
- Limit the number of ideas presented

# Practice Good Writing

- Avoid the passive voice
- Explain technical terms
- Use “sentence headlines” that inform
- Captions should explain, not just label

# Template for 1-page science translation

Effective science translation is essential for developing good public policy  
*by Really Effective Undergraduates.*



*caption*

**Heading.** <50 words....

**Describe the issue in 1-2 sentences (convince the audience that they care)**

**Heading.** <50 words...

**Possible solutions/options**



*caption*

**Heading..** < 50 words...

**Results, outcomes, advantages, policy implications**

**The bottom line.:** < 20 words....

**The title contains your message**

**Simple captions contain bite-size messages**

**Repetition fosters learning**



Senator George J. Mitchell  
Center for Environment  
and Watershed Research

# Limits on watershed imperviousness protect surface water quality

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MAINE DEP

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Additional copies are  
available from the DEP,  
the Mitchell Center,  
and on the web at  
UMaine.edu/WaterResearch



*Sucker Brook in Hampden is one of Maine's streams under urban pressure.*

## SUMMARY

Maine is unique in its bounty of natural wonders, from the majestic western mountains, the rocky Atlantic coast, the dense northern forests, to the clear blue lakes, streams, and rivers. Maine shares one thing in common with the rest of the country, however, and that is the rapid expansion of its urban and suburban areas.

Urban expansion is a particularly harsh threat to lakes and streams.

Urbanization alters the landscape and changes ecological characteristics, resulting in degraded streams. A recent study from the University of Maine (Morse, 2001) in cooperation with the *Maine Department of Environmental Protection (DEP)* and the *Senator George J. Mitchell Center for Environmental and Watershed Research at the University of Maine*, provides an important perspective on the influences of development on the physical condition, water quality, and biological communities of streams.

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# Questions?

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- Mary Ann McGarry, Ed.D
- Steve Kahl, PhD.

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